

AMERICAN AVIATION MAGAZINE SINCE 1937

REFERENCE COPY

APRIL, 1959



airlift

WORLD AIR TRANSPORTATION

In This Issue:

- WANTED: A SMALL TURBOFAN
- WHAT'S WRONG WITH INTERIORS
- NEW AIR BATTLE OVER PACIFIC



THE SUN NEVER SETS ON **wilcox** VOR...

... because 25 different countries on six continents rely on this equipment to provide dependable, all-weather navigational facilities. Of the hundreds of commercial VOR's installed throughout the world, well over 3 out of 4 are Wilcox! Moreover, Wilcox VOR is the standard of the U. S. Air Force, U. S. Navy and U. S. Signal Corps, Army Aviation. Wilcox reliability has been proven by operation in every conceivable condition of environment from the Arctic to the Equator. Installations have been certificated under the rigorous CAA Regulation TSO-N27 for scheduled airline IFR operation.

Your complete satisfaction is guaranteed by Wilcox's lengthy manufacturing experience . . . the services of our Engineering staff who will provide you with technical assistance . . . and the immediate availability of parts from our extensive spare parts inventory.

For complete details on how a Wilcox VOR can benefit you, write, wire or phone . . .

wilcox

ELECTRIC COMPANY, INC.
Fourteenth & Chestnut Sts.
Kansas City 27, Mo., U. S. A.

APRIL

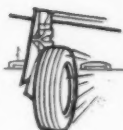
HERE'S SKID PROTECTION

sure and simple



Basic units of the Goodyear Anti-Skid System—
specified for the Convair B-58 and Republic F-105. Installed on a 2-wheel fighter, the system weighs under 6 lbs.

1 FIRST, CONSIDER THIS—At today's high landing speeds, a skidding tire can "flat spot" in two seconds. Several seconds later, it will blow out—endangering plane and personnel, requiring costly down time that can wreck flight schedules. The pilot—sitting ahead of wheels—can be unaware of danger until too late.



3 PROOF OF EFFECTIVENESS? Goodyear Anti-Skid System—specified for both the Convair B-58 and Republic F-105.

Goodyear Skid Warning System—exhaustively tested and enthusiastically received by military and commercial pilots. FAA-approved for Douglas DC-7B and DC-7C Aircraft.

Goodyear Pilot Modulated System—now proving itself on one of the newest military jets.



2 TO ANSWER THE PROBLEM—Goodyear offers three compact skid control systems: Skid Warning System* instantly raps the pilot's brake-pedal foot when skid is imminent. He allows for skid, keeps control.

Anti-Skid System automatically releases brake pressure until skid danger has passed. Brake is reapplied automatically.

Pilot Modulated Anti-Skid System is combination of other two. Provides automatic skid protection yet allows pilot control if desired.



4 FOR DETAILED INFORMATION on these 3 miniaturized, lightweight skid control systems—and specific facts that will help you decide which system is best for you—write Goodyear, Aviation Products Division, Akron 16, Ohio, or Los Angeles 54, California.



AVIATION PRODUCTS BY

GOODYEAR

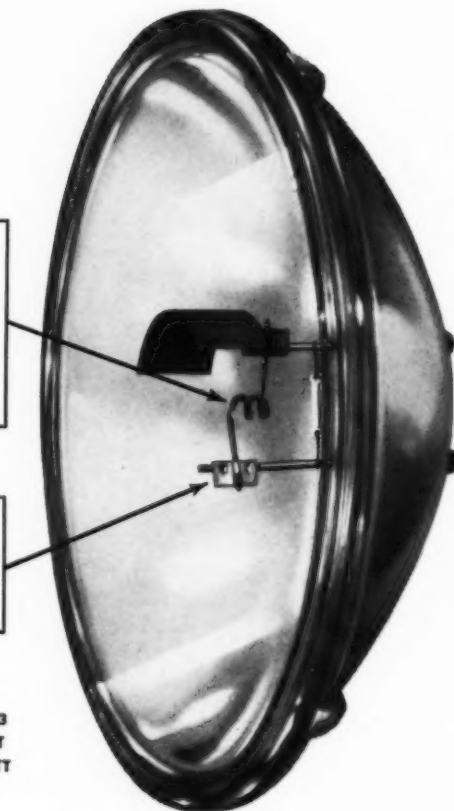
*Patents pending

NEW G-E "Small Plane" LANDING LAMP lasts longer...puts more light farther down the runway!

RUGGED COILED-COIL FILAMENT needs no support wire to prevent sagging, eliminates premature failure caused by "sawing action" of support wire and filament.

METAL STRAP anchors each filament to a lead-in wire, insures constant beam aim.

**G-E 4553
28-VOLT
250-WATT**



Now General Electric offers small-plane owners a new landing lamp with construction features like those used by large commercial and transport aircraft. G-E 4553 Landing Lamp has a special coiled-coil filament that needs no support wires, so there's no more sawing action that wears through ordinary filaments, shortens lamp life. And instead of being welded to the lead-in wires, this new filament is fastened by means of clips that can't crystallize and let go. What's more, the filament is precisely designed and located so you have a better circular beam pattern of more even light distribution.

The new G-E 4553 Landing Lamp replaces the #4523, and is interchangeable with it. Same price, yet you get all these benefits! Ask your G-E Lamp distributor about Landing Lamp #4553—and get all the facts on greater take-off, landing and taxiing safety. General Electric Co., Miniature Lamp Dept., Nela Park, Cleveland 12, Ohio.

Progress Is Our Most Important Product

GENERAL ELECTRIC

Circle No. 23 on Reader Service Card.



EDITOR
WAYNE W. PARRISH

SENIOR EDITORS

Joseph S. Murphy
Fred S. Hunter

Eric Bramley
Anthony Vandy

ASSOCIATE EDITORS

De Witt Ballew
Robert Burkhardt
Richard van Osten
Charles Schaeffer
Wallace I. Longstreth

Bill Combs
Betty Oswald
Richard Golden
Gerald Fitzgerald
Mel Sokol

Jean-Marie Riche

CONTRIBUTING EDITORS

J. D. Smith
William V. Henzey

Selig Altschul

CORRESPONDENTS

Hans G. Anderson, Sweden; Hugh Caruthers, South Africa; Paulo Einhorn, Brazil; Felipe E. Ezquerro, Spain; R. N. Hughes-Jones, Australia; T. V. R'Chandran, India; G. Stifani, Italy; Douglas S. Clark, Argentina; B. van der Klaauw, Netherlands; Wolfgang Wagner, West Germany; Kazuo Takita, Japan.

ART

William H. Martin Director
Basil Guiley Assistant
Frank F. Kozielek Assistant

PRODUCTION

John Walen Manager
Elsie Gray Assistant

EDITORIAL AND BUSINESS OFFICES

Lawrence L. Brettnier, Circulation Director; George F. Peterson, Research Manager; Fay D. Crowley, Advertising Service Manager; 1001 Vermont Ave., N.W., Washington 5, D.C., U.S.A. Phone: Sterling 3-5400. Cable: AMERAV.

REGIONAL

New York City: 17 East 48th St., New York 17, N.Y., Frederick W. Pratt, regional advertising manager. Phone: Plaza 3-1100. West Coast: 8929 Wilshire Boulevard, Beverly Hills, Calif., Fred S. Hunter, manager; William F. Toomey, regional advertising manager. Phone: Oleander 5-9161 and Olympia 7-1555. Canada: Allin Associates, 12 Richmond Street East, Toronto 1, Ontario. Phone: Empire 4-2001. Allin Associates 2055 Mountain Street, Montreal, Quebec. Chicago: 139 N. Clark St., Chicago 2, Ill. Richard K. Helwig, regional advertising manager. Phone: Central 6-5804. Florida: 208 Almeria Ave., Coral Gables, Fla. Richard D. Hager, sales representative. Phone: Highland 4-8326. Geneva: American Aviation Publications, 10 Rue Grenus, Geneva, Switzerland. Norall & Hart Ltd., 28 Bruton Street, London, W. 1, England. Phone: Grosvenor 8356. Frankfurt: Horst Horlitz, Friedrich Ebert Anlage 3, Frankfurt/Main, Germany. Paris: Jean-Marie Riche 11 Rue Condorcet, Paris (9e). Phone: TRU 15-39. Cable Address: NEWS-AIR PARIS.

SUBSCRIPTION RATES

Single copies—50 cents. For U.S. Possessions, Canada, and Postal Union Countries 3, 5, 8, 11, \$3.00 for 1 year, \$5.00 for 2 years, \$6.00 for 3 years. Other countries—\$5.00 for 1 year, \$9.00 for 2 years, \$12.00 for 3 years. Subscriptions limited to aviation industry personnel.

INCORPORATES

Airports and Air Carriers; Aviation Equipment; The American Pilot; Aviation Sales & Services; U.S. Aviation; American Airports; Airports & Helicopters and American Aviation. All rights to these names are reserved.

CHANGE OF ADDRESS

Send old address (exactly as it appears on mailing label on your copy of magazine) and new address, including zone number if any to AIRLIFT, 1001 Vermont Avenue, N.W., Washington 5, D.C. Allow two weeks for change.

PUBLISHING INFORMATION

Published once a month by American Aviation Publications, Inc., Washington, D.C. Printed at The Telegraph Press, Harrisburg, Pa. Application to mail at second class postage rates is pending at Washington, D.C. and additional mailing offices.

Wayne W. Parrish Publisher
Hugh A. Day Assistant Publisher
Gerald T. O'Mara Adv. Sales Mgr.
Leonard A. Eisner General Manager



Copyright 1959, by American Aviation Publications, Incorporated



AIRLIFT

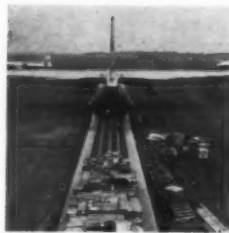
airlift

MAGAZINE OF WORLD AIR TRANSPORTATION

CONTENTS

C-133 IS U.S. ANSWER TO BERLIN CRISIS

The situation at Berlin grows hotter all the time and the possibility of another airlift is imminent. The C-133 is America's retaliation. Page 26.



CANADAIR'S 540 LOOKS GOOD

Capt. Byron A. Moe takes the turboprop model of the Convair for a ride. What he found out gives this new airplane a clean slate. Page 40.



BUTLER'S DOING BIG BUSINESS

Dick Fell, Washington, D.C., manager for Butler Aviation gives some inside details on how this fixed base operator is grossing \$2 million. Page 53.



BRANIFF WATCHES ITS MAINTENANCE

Braniff Airways has opened up a new \$6.5 million base at Dallas' Love Field. To see what it looks like see the picture story on page 75.



NEWS & TRENDS

Trends	13
News Highlights	17
Industry News	37

SPECIAL FEATURES

Wanted: A Small Turbofan	23
Will CAB's Blank Checks Bounce	24
The C-133 . . . Answer to Berlin Crisis	26
What's Wrong With Aircraft Interiors	28
Helicopters Make Big Bid for Traffic	31
British Independents Push BOAC, BEA	33

ENGINEERING

A Pilot Checks Out Canair's 540	40
---------------------------------------	----

FINANCIAL

Airline Stocks Lure Trust Funds	43
---------------------------------------	----

ATC/COM/NAVAIDS

New Cable to Ease North Atlantic ATC	49
---	----

BUSINESS FLYING

Youngstown Airways Profits by Leasing	51
--	----

FIXED BASE OPERATIONS

How Butler Grosses \$2 Million	53
--------------------------------------	----

AIRPORTS

How Washington National Makes Money ..	55
--	----

MAINTENANCE

Braniff's \$6.5-Million Overhaul Base	75
---	----

DEPARTMENTS

Personal View ...	7	Airlifts	58
Letters	11	Sales Talk	63
Books	11	About People	64
When & Where ...	11	Regulatory	65
How's Traffic	44	Par Avion	66
Cockpit	50	Equipment World ..	67
Extra Section	57	En Route	78
		Aircraft Data Cards	79

Coming Next Issue: AIRLIFT's 10th annual air transport progress issue complete with all of the vital statistics that have made this edition a year-round reference. **Watch for:** AIRLIFT's first guest editorial authored by one of the leading authorities in world air transport. **Including:** Air Transport Assn.'s 20th edition of ATA Facts and Figures.

TWA proudly presents
THE WORLD'S FASTEST JETLINER!



TWA BOEING 707

Now! The new **TWA BOEING 707** brings you the miracle of pure-jet flight. It is the fastest, most comfortable jet airliner in the world.

You'll fly half a mile in the time it takes to read this sentence. It is that fast. You'll talk in whispers. It is that quiet. You'll relax completely, no vibration. It is that smooth. And you'll come back to fly this luxurious ship-in-the-sky again and again. It is that great. For reservations, see your TWA travel agent or call TWA.

FIRST AND ONLY JET NON-STOP BETWEEN NEW YORK AND SAN FRANCISCO

FLY THE FINEST... FLY TWA BOEING 707

USA • EUROPE • AFRICA • ASIA

Welcome Aboard

This is the first issue of American Aviation under its new name of AIRLIFT. We welcome your comments.

We have had many letters from readers expressing regret that the name which has been familiar in aviation publishing since 1937 was being changed.

But we think you'll like the new format and new frequency. All of the signs are good.

Next issue—May—will feature our annual air transport review. It will be a big number packed with useful information and data not to be found elsewhere. Glad to have you aboard.

How Far Does Federal Authority Go?

Air transportation the world over is subjected to more public scrutiny than probably any other single field of endeavor. But nowhere is the fish bowl life of management so spotlighted as it is in the United States.

Two major recent developments demonstrate the vast powers of inquiry and inspection inherent under broad interpretations of the Federal Aviation Act.

The first is the very comprehensive investigation of the Air Transport Association now under way by the Civil Aeronautics Board. In less than a week after the order was issued the anti-trust division of the Department of Justice moved in with an investigation of its own. Hard on the heels of Justice came the Treasury Department with its own inquiry.

The second involves a rather extraordinary move by agents of the CAB in the Pan American-National agreements case which has just been heard. In the belief that the two carriers had not filed complete data and documents pertinent to the case, eight CAB agents with synchronized watches and badges of authority marched in pairs into the main offices of PAA and National in New York and Miami respectively, and into the Washington offices of each carrier, and began scrounging in wastebaskets and desks, and entering office files, and photographing data which they were presumed to be seeking.

Not without reason, the carriers are becoming alarmed at the boldness of what could be construed as police state tactics. No one questions the federal right of inquiry when it comes to public air transportation, but such broad authority can lead to abuses when lower-echelon staffs are permitted to run rampant through company offices.

The full-scale investigation of ATA will probably take a long time and the outcome is certainly not discernible at this point. CAB insists that its inquiry into budget, voting control, dues, and a myriad of other items, is not related in the slightest to the Justice inquiry into possible anti-trust implications. Certainly the latter can be traced directly to the Celler House Committee recommendations of several years ago. Treasury's interest is in the realm of whether ATA is, in fact, a non-profit (and thus tax-free) organization.

The peremptory and Gestapo-like manner in

which ATA learned of the investigation now turns out to be the result of a mix-up within CAB itself. Somebody slipped, somebody goofed. The agents who arrived on the scene had assumed that ATA had been informed of the order in advance (as had been planned), hence were miffed at being stalled on arrival. It was a comedy of errors which came close to becoming a tragedy of errors. It is at least re-assuring that CAB members had not approved such tactics nor had intended to pull off what looked like a police raid.

Why the drive against ATA at this time? Doubtless one major reason is to justify CAB's contention that ATA should not be a party in CAB proceedings, that it has overstepped its bounds as a trade association and is participating in many activities without authority or approval of all of its members. But the issues in the investigation are much broader than that. Is CAB retaliating against ATA's sharp criticism of the Board? The underlying motives will be forthcoming as the inquiry progresses.

Meantime CAB needs to exercise more control over its staff, and it might make an inquiry of its own activities. Much of the eager-beaver activity by agents has been sparked by Jacob Rosenthal, a 40-year-old ten-year staff veteran who is now chief of the carrier relations division. Rosenthal is considered to be one of CAB's bright stars. He has an able and alert legal mind. But he suffers from an over-exuberance of crusading in certain directions. One would feel better about Rosenthal's handling of his job if he would stop sitting on some types of cases such as one scandalous air freight forwarder complaint that has been awaiting a hearing for over two years. The investigating energy within CAB is strangely unbalanced.

Recent developments have demonstrated the penetration of federal power into the remotest reaches of the air transport industry. How far does this authority really go? Here is a major area of vast importance which needs clarifying by Congress.

Wayne W. Parish

* **A / F / C**



Salute to Sud Aviation —

2,000,000 miles of jet experience !

Salute to Air Algerie, Air France, Finnair, Royal Air Maroc, S.A.S., Sabena, Swissair and Varig airlines, for their selection of Caravelles.

Salute to Air France and other airline customers for the exclusive selection of Lear Automatic Flight Controls.

Lear A/F/C's provide passenger comfort, navigation accuracy and economy, plus an "on-timeness" heretofore unknown in any scheduled airline operation. Thousands of Lear Automatic Flight Control systems...flying all types of aircraft, all over the world...are setting the standard for automatic flight.

LEAR



***Automatic Flight Controlled**

— BY THE LEAR L-102B

Many types of Lear A/F/C's are used in thousands of military jets—including Boeing's KC-135 transports.

Specified and used in the new Lockheed JetStars... McDonnell's 119... and in Piedmont Airline's new Fairchild F-27 propjetliners.

Thousands more in use in every kind of prop-driven aircraft—including helicopters.

Lear is setting the standard of performance for A/F/C throughout the world. Lear A/F/C's can solve the all-weather "on-timeness" schedule problem.

LEAR L-102 TRANSPORT A/F/C
Designed to meet the operating requirements of all high-performance aircraft



3171 SOUTH BUNDY DRIVE
SANTA MONICA, CALIFORNIA



LEAR

CP-24

FULLY TRANSISTORIZED
CAA APPROVED — AIRING COMPATIBILITY



World's newest, fastest long-range jetliner ...the Boeing 707 INTERCONTINENTAL

The Boeing 707 Intercontinental, shown above on its first flight, will bring a new order of performance to the air routes of the world when it goes into service later this year.

This new Boeing jetliner has greater range and payload capabilities than any other jet transport. With a range in excess of 5,000 miles with full pay-

load, it is designed to fly nonstop over the longest stages of airline routes. Cruise speed is more than 600 mph.

The Intercontinental is a longer range sistership of the 707 Stratoliner. Although it is the world's newest long-range jetliner, the Intercontinental is a *proved* aircraft . . . backed by more than 4½ years of flight testing of the

707 prototype, as well as extensive test programs completed by production 707s. Since going into service last October, the 707 Stratoliner has been demonstrating the unparalleled passenger-appeal of Boeing jets. Public response, in the words of the operating airline, is "the most enthusiastic to a new airliner in aviation history."

BOEING 707 *Intercontinental*

*These airlines have ordered 707 and 720 jetliners (*indicates Intercontinental purchasers):* *AIR FRANCE • *AIR INDIA • AMERICAN • *B.O.A.C. • BRANIFF CONTINENTAL • IRISH • CUBANA • *LUFTHANSA • *PAN AMERICAN • QANTAS • *SABENA • *SOUTH AFRICAN • TWA • UNITED • *VARIG • Also MATS

L
St
CA
cep
yo
tio
att
len
yo
A.
Mr
val
a t
not
T
wit
mo
rep
mo
des
pay
low
pro
sala
Eise
F.
loc
B
the
puls
he n
D
Am
of t
line
Russ
the
only
the
E
not
sugg
when
this
mag
tion,
tion
Amer
to je
will
A P
MUG
ING
AME
STOR
MOV
IS F
FARE
GINN
CAP
PERIO
ERN
MOU
SEAB
ON
AFFE
LIMIT
POINT
AGEN
RESO
DRED
APRIL

LETTERS

Storm About Salaries

One of my reasons for reading AMERICAN AVIATION is to monitor the misconceptions you manage to spread, through your biased editorials and clever selection of "letters" for publication.

I am referring generally to your blind attitude toward pilot management problems, and specifically, to a "letter" from your brooding meteorologist friend Mr. A. F. Merewether in the February 9 issue.

Do you or Mr. Merewether think that Mr. C. R. Smith, who really knows the value of a dollar, would voluntarily put a third pilot on an airplane if he were not convinced of the need?

This foolish comparison of pilot pay with that of the Secretary of Labor gets more ridiculous each time some parrot repeats it. If the Secretary makes less money than an airline pilot, he certainly deserves a raise, not because the pilot's pay is too high but because his is too low. Irrelevant pay comparisons don't prove a thing. For instance, compare the salaries of Ted Williams and Dwight Eisenhower, the Secretary of Labor, A. F. Merewether, and the principal of our local high school.

By the way, considering the attitude of the Secretary of Labor toward your "compulsory arbitration" pitch, don't you think he rates a pay cut?

Does Mr. Merewether suggest that all American salaries be reduced to the level of the Russians, or just those of the airline pilots? When you consider that the Russian airline pilots are supposed to be the elite of Soviet aviation, and earning only \$700 a month, what do you suppose the workers are making?

ROBERT D. THOMAS
Captain, American Airlines
South Hamilton, Mass.

Editor's Note: *Letters to the Editor* are not "cleverly selected" as Captain Thomas suggests, but are printed as received, whether or not they reflect the views of this magazine or other readers. As for this magazine's views on the "third pilot" question, it has never expressed any opposition whatever to the policy adopted by American Airlines in adding a third pilot to jet crews, in fact favors any move that will improve jet safety.

A Post-Conference Decision

MUCH DISTURBED BY ARTICLE REGARDING IATA TRAFFIC CONFERENCES IN AMERICAN AVIATION MARCH NINTH STOP ACTUAL POSITION SUBJECT AT MOMENT TO GOVERNMENT APPROVAL IS FOLLOWING FIRSTLY ALL PASSENGER FARES ARE CLOSED FOR THE YEAR BEGINNING APRIL FIRST SECONDLY ALL CARGO RATES CLOSED FOR THE SAME PERIOD THIRDLY SEABOARD AND WESTERN PARTY TO AND BOUND BY UNANIMOUS VOTES FOR BOTH FOURTHLY SEABOARD REVISIONS OF RESOLUTIONS ON AGENCY WILL NOT IN ANY WAY AFFECT FARE STRUCTURE BUT ARE LIMITED IN THEIR EFFECT ONLY TO APPOINTMENT AND COMPENSATION OF AGENTS STOP MOREOVER SEABOARD'S REVISION EFFECTIVE ONLY ONE HUNDRED AND EIGHTY DAYS AFTER CLOSE

OF CONFERENCE AT PARIS ON FEBRUARY TWENTY-SIXTH STOP RESCISSION CAN BE WITHDRAWN AT ANY TIME UNTIL EFFECTIVE DATE IN AUGUST STOP HOPE YOU WILL ACT AS QUICKLY AS POSSIBLE TO CORRECT THIS STORY THROUGH AVIATION DAILY AND OTHERWISE IN ORDER AVOID ANY CONFUSION AND MISUNDERSTANDING

S. RALPH COHEN
PUBLIC RELATIONS OFFICER, IATA.

Editor's Note: *The facts in the article and those related by Mr. Cohen are in agreement except for the effective date of Seaboard's action. Both Seaboard and others at the Conference understood the effective date to be April 1, as reported in the article. By a post-conference ruling of the chairman, this was changed to the August date.*

A Spot for AIRLIFT

I have just finished reading the announcement in the AVIATION DAILY of the change in your publication and send my best wishes for a most successful enterprise. A magazine devoted exclusively to airlift has certainly been needed for many a year . . .

J. W. DRAPER, JR.
312 S. Orchard St.
Vacaville, Calif.

Books

AIA Looks Back at 1958

Aircraft Year Book. James J. Haggerty, Executive Editor. American Aviation Publications, 1001 Vermont Avenue, N.W. Washington 5, D.C. 486 pages. Price \$6.00.

A complete pictorial review of the outstanding aviation events of 1958 is featured in the fortieth annual AIRCRAFT YEAR BOOK which has just come off press.

General Orval R. Cook, president of the Aircraft Industries Association, summarizes in his foreword that this edition of the AIA's official Year Book "... reports what future historians may well consider as the most dramatic year in aviation history from the standpoint of progress, experimentation, and development in widely diverse fields.

In addition to a review of aviation events, the 1959 AIRCRAFT YEAR BOOK presents in its 486 pages photographs, specifications, and 3-view drawings of planes, missiles and engines currently in production, operation, or development. It contains a chronology of American aviation history from its beginning to the present day plus a listing of official aviation records.

The second edition of the AIRCRAFT YEAR BOOK to be published under the banner of American Aviation Publications, Inc., this volume contains the same dramatic improvements noted in the 39th edition. Page size has been increased to 8 x 11, photographs and artwork have been used liberally in a new format designed for easy reading.

When & Where

APRIL

- Apr. 12-15—American Association of Airport Executives, annual convention, Savannah, Ga.
- Apr. 12-18—First World Congress of Flight combined with Air Force Assn.'s annual Jet Age Conference, Las Vegas, Nev.
- Apr. 12-19—Air Line Pilots Association, annual air safety forum, Las Vegas, Nev.
- Apr. 14-15—Illuminating Engineering Society, Aircraft Lighting Committee, IAS Bldg., Los Angeles, Calif.
- Apr. 15—ATA Airport Cargo Terminal Facilities Committee, ATA Conference Rm., Washington, D.C.
- Apr. 16-17—Aeronautical Training Society, 17th annual meeting, Desert Inn, Las Vegas, Nev.
- Apr. 17-18—Third National Conference on Aviation Education, Riverside, Calif.
- Apr. 20-21—Air Industries and Transport Association of Canada, semi-annual meeting, Victoria, B.C.
- Apr. 20-21—ATA Chief Pilots Meeting, Villa Hotel, San Mateo, Calif.
- Apr. 21-23—International Airline Navigators Council, 9th Annual Convention, Hotel Manhattan, New York
- Apr. 22-24—ATA Operations Conference, Villa Hotel, San Mateo, Calif.
- Apr. 23—UCLA Institute of Navigation, Eastern regional meeting, Friendship Int'l Airport, Baltimore, Md.
- Apr. 23-24—Association of Local and Territorial Airlines, regional quarterly meeting, Bel Air Motor Hotel, St. Louis, Mo.
- Apr. 24-30—ATA Air Traffic Conference Committee, spring meeting, Sheraton-Park Hotel, Washington, D.C.

MAY

- May 4-6—Institute of Radio Engineers, Dayton Section, 11th national aeronautical electronics conference, Dayton, O.
- May 4-14—IATA, 12th Technical Conference, Hotel Claremont, Berkeley, Calif.
- May 7-9—American Helicopter Society, 15th annual national forum, Washington, D.C.
- May 18-21—Society of Aeronautical Weight Engineers, 18th annual national conference, Hotel Henry Grady, Atlanta, Ga.
- May 20-22—American Society of Civil Engineers, 2nd Jet Age Airport Conference, Shamrock Hilton Hotel, Houston, Tex.
- May 26-28—Institute of the Aeronautical Sciences, San Diego Section, regional meeting on supersonic transports, San Diego, Calif.
- May 28-31—Federation Aeronautique Internationale, annual conference, Moscow.

JUNE

- June 4-5—Institute of Radio Engineers, third national conference, Villa Hotel, San Mateo, Calif.
- June 5-6—Reading Aviation Service, Inc., 10th annual maintenance & operations meeting, Reading, Pa.
- June 12-21—International Air Show, Le Bourget, Paris.
- June 23-25—Aviation Distributors and Manufacturers Association, 33d meeting, St. Francis Hotel, San Francisco.

JULY

- July 14-15—Airlines Electronic Engineering Committee, Ambassador Hotel, Los Angeles, Calif.
- July 16-17—Radio Technical Commission for Aeronautics Assembly, Ambassador Hotel, Los Angeles, Calif.
- July 28-30—Air Cargo, Inc., annual airfreight cartage convention, Chicago, Ill.

SEPTEMBER

- Sept. 7-13—Society of British Aircraft Constructors, annual flying display and exhibition, Farnborough, Hants, England.
- Sept. 30-Oct. 2—Southeastern Airport Managers Association, Durham, N.C.

OCTOBER

- Oct. 5-10—Society of Automotive Engineers, national aeronautics meeting, aircraft manufacturing forum and aircraft engineering display, The Ambassador Hotel, Los Angeles.
- Oct. 10-15—National Association of State Aviation Officials, 28th annual meeting, Mark Hopkins Hotel, San Francisco.



Nankervis builds **86%** of all component test equipment for commercial jet engines!

USERS OF NANKERVIS JET ENGINE TEST EQUIPMENT:

Air France
American Airlines
Delta Air Lines
Eastern Air Lines
KLM Royal Dutch Airlines
Pan American World Airways
Qantas Empire Airways
Sabena Belgian World Airlines
Swissair
United Air Lines

EXPORT REPRESENTATIVES

EUROPE — American Avitron, Inc.
JAPAN — C. Itoh and Company
CANADA — Aeromotive Eng. Products, Ltd.

Here's why. Since 1945, Nankervis has been a leader in supplying test equipment to the military and to the aircraft industry to verify top performance in jet engines. Although the commercial jet age was then yet a dream, Nankervis was already developing the foundations for commercial jet engine testing.

The dream has now materialized. Nankervis' painstaking pioneering efforts and top-notch results have been accepted as the standard of the industry. Nankervis delivered the *first* jet engine test equipment for commercial airline use. And to date, Nankervis has built or is building over 86% of all jet engine component test equipment ordered by domestic and foreign commercial airlines.

Nankervis welcomes the opportunity to send you literature describing jet engine test equipment and Nankervis engineered test cells. *George L. Nankervis Company, 15000 Fullerton Avenue, Detroit 27, Michigan.*

Write for Jet Engine Test Equipment Catalog 1383

GEORGE L.

NANKERVIS

COMPANY





Insurance Battle

Here's a tip on an all-out battle on a national scale, with many forthcoming surprises: insurance concessions at airports. Congressional committee that looked into airport insurance sales last year is active again. But state insurance commissions may produce the most sparks. Stakes are big. So is the money volume. Insurance companies face some rough going, as things look now. So do some airports for grabbing off the bulk of revenues as the price for franchises.

Europair Moves Slowly

Major changes at CAB will take place before yearend, with two Republican vacancies coming up. Chairman Durfee is well assured of Court of Claims judgeship, a coveted post, but he'll remain on CAB long enough to complete several important pending cases. Chan Gurney, who thought he had chairmanship wrapped up for this year, may get his wish when Durfee leaves. Other replacement will be for Harmar Denny, whose term expires at the end of this year—but he may not wait that long to depart. There's hot competition for the two posts. West Coast politicians are demanding western representation.

Move toward integration of operations by five European "common market" airlines is taking a long time to show any positive results. Negotiations between the "Europair" operators—Air France, KLM, Lufthansa, Sabena and Alitalia—have been in progress for several months. Aim is to meet U.S. jet competition by coordinating operations, pooling maintenance, leasing equipment—similar to SAS-Swissair deal. But the five lines have different jet types on order; managements have widely differing views on how to achieve coordinated operations. Best bet: initially there'll be increased pooling of flights and reduction of competitive scheduling, rather than equipment leasing.

\$1 Billion in Business Aircraft

A lot of toes may have been stepped on by FAA Administrator Quesada during the federal-aid-to-airports fight and he may have made himself unpopular, but he's proved to be a firm friend of civil aviation in his dealings on air traffic control with the military. Probably no other man in the U.S. could have stood up to the military in past few months as Quesada has done—and get by with it. He's determined to merge civil and military traffic control fairly and squarely in interests of safety and the traveling public. His record to date on this score is very high.

Market for utility and corporate aircraft is growing fast. Sales last year were about \$134 million. Lockheed thinks they can rise to \$1 billion spread over the next five years. This is one reason why it's pushing JetStar production without waiting for a military order. It's also exploring possibilities of an airborne interurban bus and a flying family sedan as outgrowth of work being done for military on vertical takeoff and landing designs.

Big Airports, Bigger Problems

New look at McDonnell's 119 and Lockheed's JetStar will be taken in mid-June by Air Materiel Command Source Selection Board. It may recommend purchase of one or both to meet requirement for a utility jet trainer/transport.

Although bigger airport terminals are in the making (such as Los Angeles), the vision of things to come can be seen at the new Miami terminal, a huge structure serving at least 27 scheduled carriers. All but Eastern have moved in; the effect is breathtaking in scope. But Miami may have made a major mistake in failing to sectionalize. A single loudspeaker system serving many carriers (with numerous announcements in two languages) may prove to be one insuperable problem among many.

Competition Takes Its Toll

A quiet switch in jet planning has been made by Capital Airlines. Letter of intent with General Dynamics Corp. has been amended to provide an order for 10 Convair 880s, delivered between October 1960 and March 1961. Original letter covered order for nine plus option on six. General Dynamics has agreed to help Capital arrange financing. Estimated cost of 10 planes plus spares: \$45 million.

Financial trouble has caught up with one Mexican airline. Aeronaves de Mexico, in debt and bucking tough competition from Eastern and Air France on its Mexico City-New York run, wants to sell out to the government. Principal stockholder Miguel Aleman, former President of Mexico, has been negotiating with Nacional Financiera, government's banking agency (to which Aeronaves is already heavily in debt).

The measures of ability

FUNCTION

WEIGHT

SIZE

Holley goes Commercial on America's First Jet Airliner

Power for America's first jet airliner is furnished by four of these compact, Pratt & Whitney Aircraft JT-3 Jet Engines which deliver more than 13,000 lbs. of thrust, each.



Holley
for Bleed
& Wh
J-57 Je



Record breaking Boeing 707 providing Americans with new speed and new comfort.

Holley Accessory selected for Pratt & Whitney Aircraft JT-3 Engine

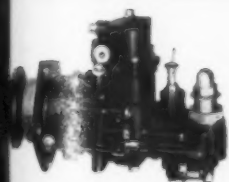
Three basic goals rule the efforts of design, engineering, and manufacturing engineers at Holley: exceed, if desirable, minimum performance standards, lessen the weight, and reduce the size to allow more freedom of location on the engine. Another proof of Holley's success in attaining these goals is the choice of a Holley engine accessory for the Boeing 707; the Holley designed, engineered, and manufactured compressor bleed governor. This product and other Holley jet engine accessories (like the ones shown below) demonstrate hour after hour, in the world's airways, the Holley skills developed over more than half-a-century.



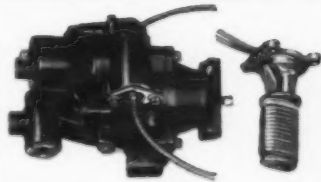
A-27 11955 E. NINE MILE ROAD
WARREN, MICHIGAN

Leader in the Design, Development and Manufacture
of Aviation Fuel Metering Devices

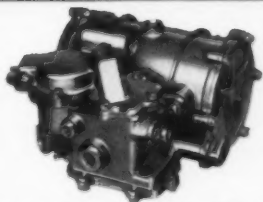
A few of Holley's Engine Accessories for Jet Aircraft



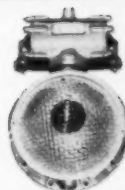
Holley designed R-92 Compressor Bleed Governor for the Pratt & Whitney Aircraft JT-3 and JT-4 Jet Engines.



A companion to the actuator is the R-98 Compressor Bleed Governor for the JT-4 Jet Engine.



Designed for Pratt & Whitney Aircraft JT-4 Jet Engine, the R-98 Bleed Piston Actuator is Holley designed and manufactured.



This bleed valve and actuator for the JT-3 Jet Engine is manufactured to Pratt & Whitney Aircraft design by Holley.

Industry Likes *airlift*

Here are excerpts from a few of the hundreds of letters received from executives on the new *airlift*

As a long-time reader of AMERICAN AVIATION I congratulate you on your ability to move with the changing times. This, of course, is one of the secrets of your success, and has been amply demonstrated in the number of publications in your portfolio.

I know that AIRLIFT will be a great success, and wish you great prosperity with it.

WALTER H. JOHNSON, JR.
Senior Vice President—Marketing
Capital Airlines

I am certainly looking forward to the new publication AIRLIFT, and I am sure that it will be the outstanding publication for the air transport industry.

M. F. FARE
Secretary & Asst. Treasurer
Piedmont Airlines

I am sure that AIRLIFT will be the same fine magazine, but the "old order changeth."

MAC WEIR
McDonnell Aircraft Corporation

I have always found your publications informative and interesting and therefore look forward to reading the new AIRLIFT.

G. F. MAXWELL
Division Manager
Pan American World Airways System

Although I have already told you personally how favorably I view the change in name, I want to reiterate what an admirable choice of title you made.

JOHN E. CANADAY
Vice President—Public Relations
Lockheed Aircraft Corporation

The problem of reading and communication in one's chosen field of activity in the aviation complex has become more difficult through the expanding years. A magazine devoted exclusively to airlift should save a lot of time and be of real interest to those of us whose prime interest lies in air transportation.

E. F. BURTON
Vice President—Engineering
Transport Aircraft Systems
Douglas Aircraft Company, Inc.

Sounds like you are making a courageous but very constructive step in regard to AIRLIFT. However, in view of Wayne Parrish's stature in the industry having to do with flying machines, you could call it "Nuts and Bolts" and it would still be a success.

WALTER STERNBERG
Senior Vice President
National Airlines

The growth and new developments in commercial air transportation, perhaps, require the change in emphasis expressed by the new name, AIRLIFT.

Flexibility has always been a requirement of progress in this changing industry. We have had to make many realignments in our own activities through the years.

We all wish you the greatest of success and will continue to give you our support.

WILLIAM P. LEAR
Chairman of the Board
Lear, Inc.

Permit me to wish you every success with your new publication, AIRLIFT.

I shall of course miss the familiar American Aviation masthead, but I know that its tradition of objectivity, sound information and service to the industry will be continued and strengthened in the new publication.

WILLIAM P. HILDRED
Director General
International Air Transport Association

I am just old-fashioned enough to sort of regret to see the name of "American Aviation" pass out of the picture. However, I hope to adjust myself to identifying your publication as AIRLIFT.

This is just a note to express my sincere hope and best wishes always for your continued success.

W. A. PATTERSON
President
United Air Lines

I think the concept is good; it is almost impossible to read everything about everything, and I gather that in AIRLIFT we will have comprehensive reporting in the aviation field, concentrating on commercial and military air transport and allied topics.

CHARLES O. CARY
Director of Sales
Electronics Division
Curtiss-Wright Corporation

AIRLIFT will be more in keeping with the evolving markets of the air.

J. GEOFFREY NOTMAN
President
Canadair

I presume that the historically qualitative coverage which has always existed will continue, so I have no argument, whatsoever, to offer with the proposal, and merely want to advise you that I shall continue to be one of your interested readers.

J. H. CARMICHAEL
President
Fairchild Engine and Airplane Corporation

The high editorial quality which you and your staff have so diligently built into your many publications would be the same under any name.

GORDON GILMORE
Vice President—Public Relations
Trans World Airlines, Inc.

I am sure this magazine will be up to the standard of AMERICAN AVIATION and shall look forward to receiving my copy.

G. W. G. MCCONACHIE
President
Canadian Pacific Air Lines, Limited

I find myself being very enthused over the new concept and the new name for AMERICAN AVIATION. I am certain it is safe to predict a wonderful future for AIRLIFT.

GORDON M. BAIN
Vice President—Sales
Northwest Airlines, Inc.

It looks like the name AIRLIFT will catch on very quickly.

J. O. MOXNESS, Director
Domestic Commercial Sales
Douglas Aircraft Company, Inc.

AMERICAN AVIATION has been "must" reading for many fellows in my age group. We learned from it what others were doing and thinking. For many years it was the only source of information available to us—company communications not always being of the best. Contained within its covers also are character studies, and whether we will admit it or not these often serve as the basis for formation of our own characters.

Many of us in the industry owe AMERICAN AVIATION a great deal—not from the standpoint of that which may have been written about us but for the reasons I have attempted to outline in the foregoing. Just as a leopard's spots do not change, neither will a simple change of AMERICAN AVIATION'S name to AIRLIFT change what AMERICAN AVIATION has meant to so many of us for so long.

LESLIE O. BARNES
President
Allegheny Airlines, Inc.

I think this is an excellent move and I am sure that AIRLIFT will be very well received in the world air transportation field and that you will gain much wider readability.

W. L. MORRISSETTE, JR.
Vice President—Sales & Traffic
Eastern Air Lines, Inc.

I, personally, will like it and read it just as I have done for a good many years. I have always felt that you and your editorial staff are publishing the best magazine in the aviation field and will continue to do so, regardless of name.

I am particularly glad to note that AIRLIFT will devote itself exclusively to commercial aviation. This is a wise move as it has become impossible to provide good coverage in the many ramifications of aviation today, and most certainly since military aeronautics are gradually shifting to missiles and space developments which will be only of casual interest to those devoted strictly to air transportation matters, including MATS.

CHARLES FROESCH
Vice President—Engineering
Eastern Air Lines, Inc.

I am sure the publication will remain the outstanding one in the industry regardless of what you call it, and you can be assured that I will look forward to receiving my copy in the future as I have in the past.

C. H. CALHOUN
Vice President—
Engineering and Maintenance
Continental Air Lines, Inc.

I believe that you have made a good decision here, because it will save those of us in the airline business from reviewing a lot of extraneous material.

Let me wish you every success for the old publication with a new name.

FRANK W. HULSE
President
Southern Airways, Inc.

I feel assured that under its new name it will go on to even greater success.

NORMAN P. BLAKE
Vice President
Pan American World Airways System

I shall of course look forward to receiving each issue of AIRLIFT and am confident that under its new masthead AIRLIFT will be an even greater success than AMERICAN AVIATION.

ANDREW B. SHIFF
President
Pan American-Grace Airways, Inc.

The new name AIRLIFT is fitting in line with the wider concept you are undertaking. We read the magazine with great interest.

GEORGE B. RAYBURN
Executive Vice President
Wien Alaska Airlines

Coming: 10th ANNUAL AIR TRANSPORT PROGRESS ISSUE including ATA Facts & Figures—

MAY *airlift*



World Congress of Flight in Spotlight

The World Congress of Flight, sponsored by Air Force Association in cooperation with six other organizations, is the center of attraction this month. Being held Apr. 12-19 in Las Vegas, the Congress will cover aircraft, missiles and spacecraft through conferences and symposiums, aerial demonstrations (including latest jet transports), and static displays of equipment. Major emphasis will be on civil aviation.

AA Sells 45 DC-6s to Ayer

In the biggest used plane deal to date, American Airlines is selling 45 DC-6s to Frederick B. Ayer & Associates for \$30 million. The airplane dealer also has right of first refusal on AA's remaining 36 DC-6s, a \$23 million transaction.

Payments will be made as planes are delivered, the last in January 1961. Included are five DC-6A cargo liners. AA has now arranged to sell 114 piston planes, or over 50% of its fleet. Ayer has contracted to buy 75.

Investigations of ATA Underway

Investigations of the Air Transport Association by CAB and the Justice Dept. are now fully underway, after much legal maneuvering. A third and more routine inquiry is being conducted by the Treasury Dept. to see if ATA is conforming to rules for tax-exempt organizations.

The Justice investigation covers antitrust matters. CAB's probe is to determine if the agency should continue its approval of ATA's organization, and to see if big airlines control actions of all carriers through ATA. The association questioned CAB's power to investigate it, calling the inquiry a "fishing expedition . . . a roving inquisitorial investigation." But, while making these moves to protect its legal rights, ATA was cooperating fully with the investigations.

MATS Cuts Commercial Airlift

About \$4 will be spent by Military Air Transport Service in fiscal 1960 on military airlift for each \$1 used for commercial lift. Ratio in fiscal 1959 is \$3 to \$1.

In 1960, MATS will use \$234,787,000 for expenses of military airlift planes against \$54 million for commercial contracts. Fiscal 1959 totals are expected to be \$220,797,000 and \$66,729,000. Congress provided \$80 million for commercial lift in fiscal 1959, urging that funds be spent promptly. But indications are that the \$80 million will be spent over 15 months rather than a year.

USAF Ordering More Transports

USAF is requesting proposals from Boeing, Douglas and Convair for an off-the-shelf jet cargo liner and is buying 32 more Lockheed C-130B turboprop cargo-personnel transports (14 in fiscal 1959, 18 in 1960). Plan is to buy 10 jets in 1960, presumably cargo versions of the Boeing 707, Douglas DC-8 or Convair 880.

CAB Studies Jet Economics

A full-fledged study of the jet economics of the trunklines will be undertaken by CAB. It will develop data on: 1)

implications of physical and operating characteristics of jets and the economics of jet transportation, 2) traffic and capacity forecasts relating to expanded capacity presented by introduction of jets and turboprops, together with retained piston aircraft, 3) jet profitability potential, 4) pricing of jet services. CAB already has asked for comments on jet pricing (see p. 65).

Airport Bill Unsettled

Attempts will be made by a conference committee to reconcile wide differences in House and Senate versions of federal-aid-to-airports legislation.

Differences are: Senate bill calls for \$100 million a year for four years plus a \$65 million discretionary fund. House wants \$297 million in four years including \$45 million discretionary. Both bills apportion 75% of funds to states on basis of population, etc., 25% at discretion of FAA Administrator. The Administration had asked a four-year \$200 million plan, 50% apportioned, 50% discretionary. Senate bill says funds can be used for terminals, except "frills" such as restaurants and bars. House limits use of aid in terminals to safety facilities, control towers, etc.

BOAC Flies Without a Permit

Although its request for a permit to serve Tokyo was still being heard by CAB, British Overseas Airways on Apr. 1 operated its first flight across the Pacific through the Japanese capital (see Pacific story, p. 30). Passengers were carried free on the unclear U.S.-Japan segment and the flight was called a "pre-inaugural." In the Pacific route case, United Air Lines asked CAB to exclude from hearings U.S.-Hawaii, and U.S.-Alaska applications plus requests to serve Pacific points from the U.S. east coast.

National Airport Plan Issued

The 1959 National Airport Plan has been issued by Federal Aviation Agency. It covers 1045 air commerce fields and 2279 general aviation airports, with projects recommended for development 1959-62. Cost estimates are included. FAA cautions that listing of an airport is not to be construed as a government commitment to participate financially. Copies are available at \$4.75 each from U.S. Government Printing Office, Washington 25, D.C.

Competition in Canada

Transcontinental competition starts in Canada on May 4 when Canadian Pacific Airlines inaugurates once-daily service Montreal-Toronto-Winnipeg-Vancouver. CPAL will use Britannias (51 tourist, 38 first-class seats), offering 623 seats weekly. The Canadian government recently awarded the route to CPAL, restricting flights to one daily, thus giving Trans-Canada Air Lines limited competition.

Large Irregular Case Appealed

Delta Air Lines asked the U.S. Court of Appeals to set aside CAB's decision establishing supplemental carriers (see p. 24). The company said CAB cannot issue certificates which fail to specify terminal points and added that there was no evidence that the carriers were fit, willing and able.



For unexcelled luxury aloft

FLY DELTA *Royal Service Flights*

Folks who discover Delta's Royal Service are eager to tell friends about the sparkle of a dinner that is leisurely, with complimentary champagne and three alert stewardesses in attendance . . . about the choice of entrée (*tenderloin steak to order, Rock Cornish Hen, or seafood on appropriate days*), the beverage service and music by Muzak. Such service in the royal manner is all at regular fare. It's truly *Royal Service*!

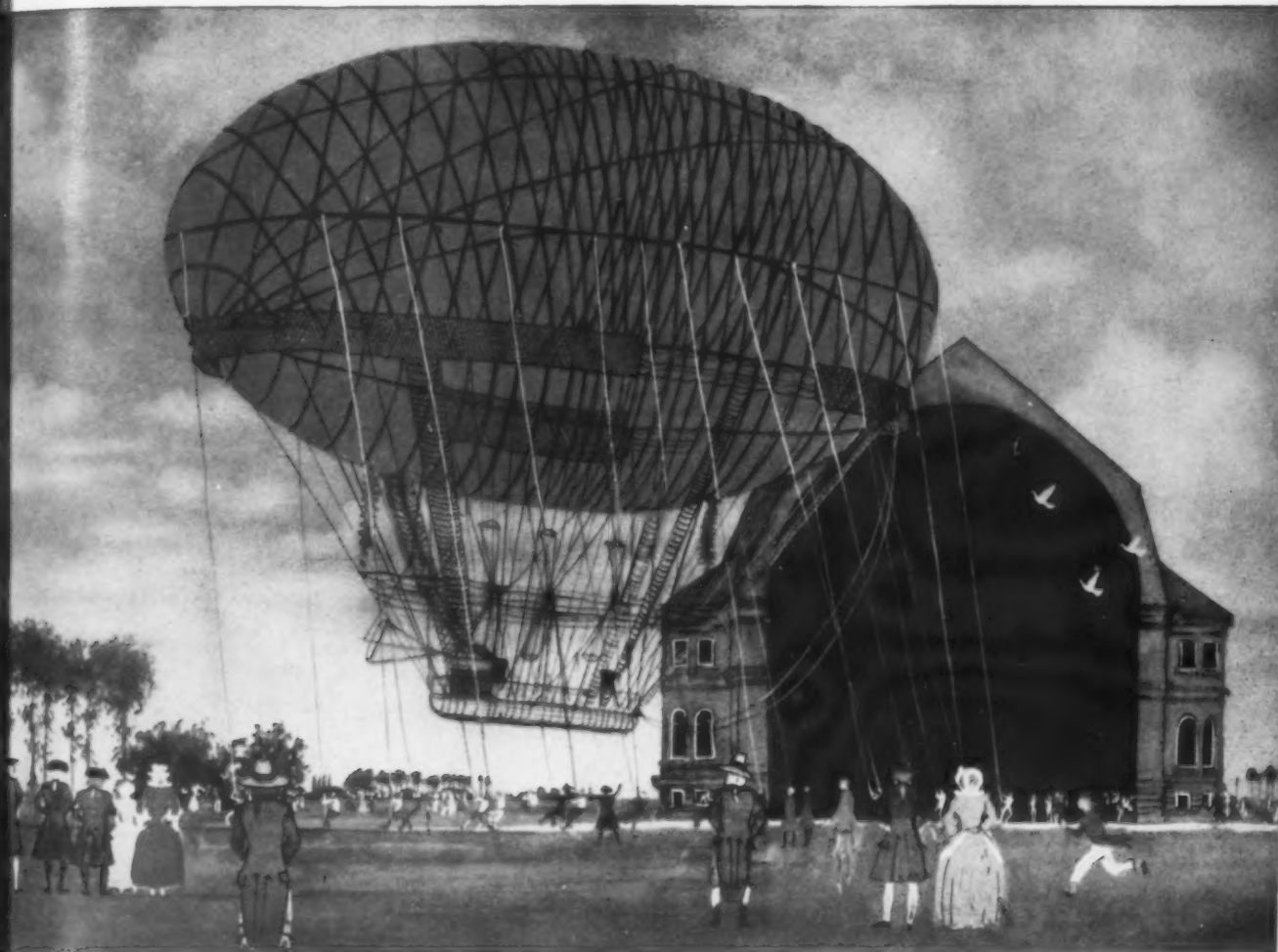
These luxurious flights serve:

NEW YORK • WASHINGTON • ATLANTA • HOUSTON • CHICAGO • MIAMI
NEW ORLEANS • DALLAS • PHILADELPHIA • BALTIMORE • MEMPHIS • DETROIT

Delta's DC-8 Jetliners are on their way!



Propulsion through the ages...



Propeller-driven airship designed by J. B. M. Meusnier, 1784

An astounding proposal : in 1784, just a year after the invention of the balloon, the Frenchman J. B. M. Meusnier conceived of an airship embodying the essentials of the modern dirigible. Beneath the gas bag hung a gondola control centre. There was a rudimentary rudder and three manually-operated propellers. A proper power plant was lacking, however, and perhaps that is why the dirigible remained a dream for another century. Aero designers of today are more fortunate. They

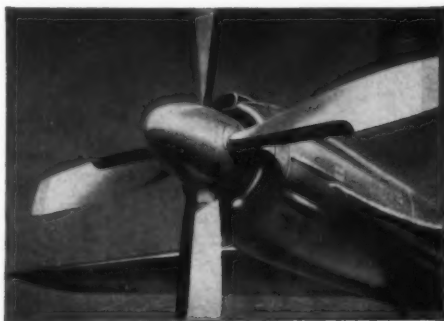
have the proper power plants available, and have fitted propellers to them, creating turbo-jet power packages. The Rotol people, for example, designed, developed and produced the propellers for the first turbo-prop aircraft and now supply over 100 airlines and aircraft operators around the world who attest to Rotol reliability. Rotol turbo-props are standard equipment on the Vickers Viscount, Fairchild F-27, Grumman Gulfstream and Fairey Rotodyne.

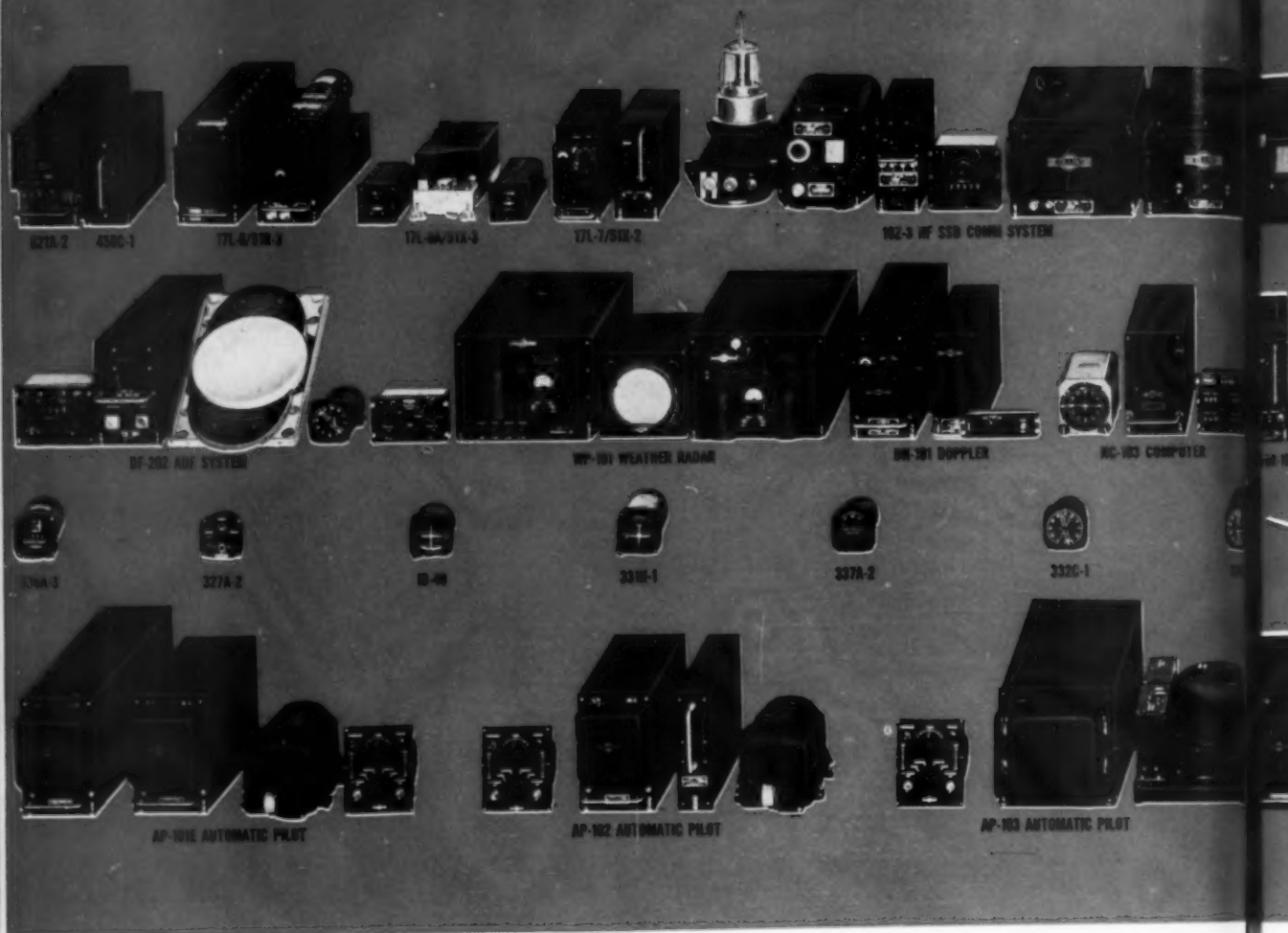
ROTOL

The world's most experienced manufacturers of turbo-propellers — over 6,000,000 hours of flying time.

Rotol Incorporated after-sales service throughout the United States provides immediate spare parts delivery, technical service on propeller operations and applications.

For information on Rotol products and after-sales service, call Rotol Incorporated, 409 Jefferson Davis Highway, Arlington 2, Virginia. Phone OTis 4-6290





Collins...the greatest line in a

COMMUNICATION

621A-2 TRANSPONDER — Receiving radar replies to AIC radar beacons. Side lobe suppression limits responses to main lobe of radiation pattern. Contains disc-cord transmitting tube, 1/2 ATR case. Transponder wt. 26 lbs.

4380-1 SEICAL — Twelve resonant read relay assemblies in each of two channels in 3/8 ATR short case. Switches on front panel auto mode selection. Inlet wt. 18.55 lbs.

17L-6, 4/918-3 VHF COMM SYSTEM — Transmitter has 360 channels, 118-129.75 mc, 50 kc spacing, 25 watts output. 918-3 provides 280 channels, 100 kc spacing, 128.5 to 135.5 mc. System wt. approximately 45 lbs.

17L-6A/918-3 VHF COMM SYSTEM — Lightweight 3 watt 90 channel transmitter, 160 channel receiver and power supply. Crystal controlled, 17L-6A tunes from 118.0-129.7; 918-3 from 128.0-136.5, 100 kc increments. System wt. 10.75 lbs.

17L-7/918-2 VHF COMM SYSTEM — Airline standard, 17L-7 provides 35 watts output on 360 channels between 118.0 and 129.7; 918-2 reception on 360 channels between 128.0

and 136.5 mc, 50 kc spacing. Crystal control. System wt. 27 lbs.

102-3 HF SSB COMM SYSTEM — Fully automatic SSB communication on 20,000 channels, 2-30 mc in 1 kc steps, 1 kw PEP. System includes Receiver-Exciter, Power Amplifier, one to three Remote Controls. Antenna complete available.

618T HF SSB COMM SYSTEM — Fully automatic SSB communication on 20,000 channels, 2-30 mc in 1 kc steps, 400 watts PEP. System wt. approximately 50 lbs.

185-4 HF COMM SYSTEM — Self contained transmitter-receiver, line associated automatic tuner. Up to 20 crystal controlled channels, 2-18.5 mc with 100 watt output.

618S HF COMM SYSTEM — Transceiver offers up to 144 crystal controlled channels in 2-25 mc range, 100 watt output. Has associated antenna tuner and power supply.

246A-1 INTERPHONE AND ISOLATION AMPLIFIER — Provides interphone, isolation and monitor amplifier functions. Wt. 7 lbs.

3460-1 PASSENGER ADDRESS AMPLIFIER — Transistorized high fidelity amplifier. Inputs for pilot, stewardess and tape reproducer. Multiposition tone control. Wt. 9.6 lbs.

NAVIGATION

DF-202 ADF SYSTEM — Includes 317-3 Receiver. Silicon diodes, dry disk rectifiers and transistors hold tube count to 11. Digital frequency presentation on Remote Control. Tunes 90 to 1800 kc in four bands. Flush or semiflush mounted antenna. Integral power supply. System wt. approximately 31 lbs.

WP-101 WEATHER RADAR — Pulse modulated operation in the C-band 5400 mc frequency range. Ranges, 20, 50, and 150 miles. Bright tube indicator allows daylight viewing without hood. Offset sweep presentation.

DN-101 DOPPLER RADAR NAVIGATION SYSTEM — FMCW SSB technique used to enable operation from 0 to 50,000 ft. Effective operation over smooth seas. Provides continuous indication of drift angle and ground speed. Dual system operates from single antenna. Calibration can be ground tested. Low power consumption. System wt. approx. 65 lbs.

NC-103 DOPPLER NAVIGATION COMPUTER SYSTEM — Processes DN-101 ground speed, drift angle and compass inputs and presents along-

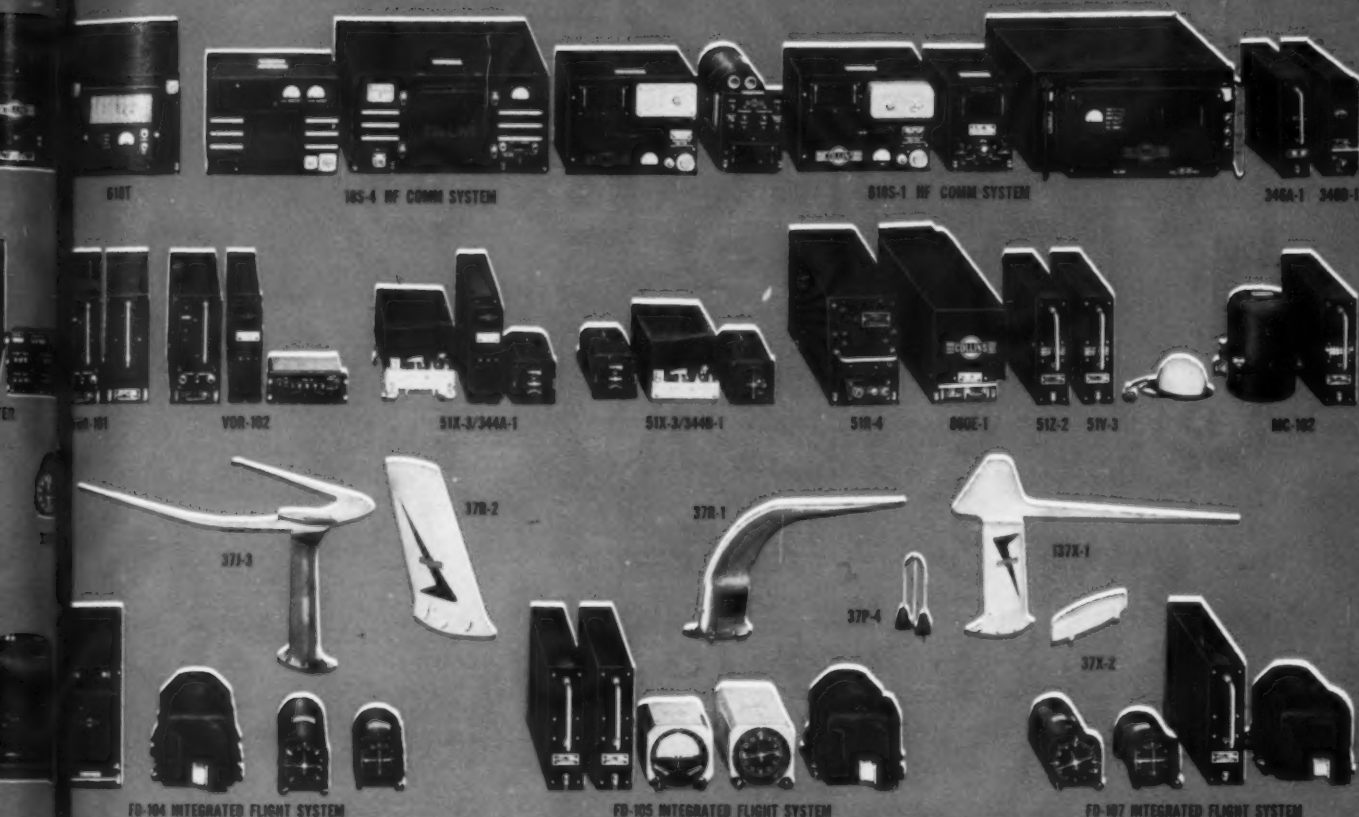
track and across-track information to set control panel. Supplies output data course line deviation indicator, course play and automatic pilot. System wt. 25 lbs.

VOR-101 VHF NAVIGATION SYSTEM — 244A-1 combines to provide 500 channels 50 kc spacing between 108.0 and 117.95 mc. Visual identifier, commutator, glide slope, QDM and RMI outputs in addition to reception. System wt. 24.5 lbs. Integral power supplies.

VOR-102 VHF NAVIGATION SYSTEM — 244A-1 combines to provide same as VOR-101 except no RMI service to 117.95 mc. 3/8 ATR short and 1/4 ATR short case. System wt. 19.5 lbs. Integral power supply.

81X-3/244A-1 VHF NAVIGATION SYSTEM — Lightweight delta navigation system on service except RMI. System wt. 10 lbs.

81X-3/244D-1 NAVIGATION SYSTEM — panel mounted 3" cases provide VOR and left-right VOR/LOC indication, bearing, to-from information and VOR selection. Associated power supply included. System wt. 12.5 lbs.



Ever since the early days of commercial aviation the prestige of Collins communication and navigation equipment has thrived, nourished by an energetic research and development program dedicated to the advancement of aviation electronics. The result is evident on these pages—the most complete line of high quality avionics equipment bearing one trademark. And even this group portrait is incomplete, lacking the scores of servos, remote control units, shock-mounts and test equipment associated with the major systems pictured. The Collins name is as important in military as it is in commercial aviation. In addition to the Collins communication and integrated electronics systems serving jet fighter and bomber squadrons throughout the world, Collins airline type equipment is widely used aboard military transports.



COLLINS RADIO COMPANY • CEDAR RAPIDS • DALLAS • BURBANK

4 VHF NAVIGATION RECEIVER — Utilizes same modules and provides the same coverage as the VOR-101. 1/2 ATR case offers optional data for identical service. Wt. 55 lbs.

51-1 DMET — Provides precise distance information for aircraft up to 200 nautical miles from associated ground beacon. Provides 1 sec. peak pulse power. Wt. 35 lbs.

53 MARKER BEACON RECEIVER — One or two light and aural indication of passage over 75 mc marker beacons. Completely transistorized. 2.5-light version, wt. 4.9 lbs.

55 GLIDESLOPE RECEIVER — Motor driven 2.5-light for frequency selection of 20 channels between 329.3 and 335.0 mc. 10 channel version is available. Flag alarm circuit included. 1/4 ATR short case. Wt. 6.2 lbs.

510 MAGNETIC COMPASS SYSTEM — Lightweight gyro-stabilized compass with output driver to drive an automatic pilot, flight director, Doppler and other navigation systems. Wt. 13.8 lbs.

INSTRUMENTATION

51-3 OMNI-BEARING SELECTOR — Enables

selection of desired track and provides to-from information. Wt. 2 lbs.

327A-2 MARKER LIGHT INDICATOR — Contains three press-to-test lights and Hi-Low sensitivity switch. Wt. 8.63 lbs.

FD-40 DEVIATION INDICATOR — VOR/ILS displacement data. Flag service. Wt. 1.9 lbs.

331H-1 COARSE SELECTOR INDICATOR — Provides cross-pointer, to-from, flag and digital course selector service. Wt. 4.6 lbs.

337A-2 OMNI-BEARING INDICATOR — Presents true bearing to VOR station and drive RMI pointers. Wt. 2.5 lbs.

332C-1 RADIO MAGNETIC INDICATOR — Dual input for VOR or ADF. Provides heading and course or ADF bearing. Wt. 2 lbs.

331B-3 ADF INDICATOR — Similar to 332C-1 indication except no magnetic heading indication. Variation set knob sets card. Wt. 1.5 lbs.

ANTENNAS

371-3 VOR NAV ANTENNA — Receives VOR and LOC signals in the 108-122 mc range. Drag of 2.6 lbs. at 200 mph. Wt. 4 lbs.

37R-2 VHF COMM ANTENNA — Receiving and transmitting antenna with maximum input capability of 125 watts. Frequency range: 116-152 mc. Drag of 0.5 lbs. at 250 mph, 1.3 lbs. at 400 mph. Wt. 2 lbs.

37R-1 VHF COMM ANTENNA — Receiving and transmitting antenna in 118-136 mc frequency range. Drag is 1 lb. at 250 mph. Wt. 2.5 lbs.

37P-4, -5 GLIDESLOPE ANTENNA — Acceptor glideslope signals in the 329-336 mc range. Negligible drag. 37P-5 has two inputs for dual glideslope receiver installation. Wt. 0.7 lbs.

137X-1 VHF COMM/NAV ANTENNA — Combined unit for communication from 118 to 136 mc and navigation from 108.0 to 127.0 mc. Drag of 15.3 lbs. at 600 mph. Wt. 4.7 lbs.

37X-2 MARKER BEACON ANTENNA — Receives 75 mc marker beacon signal. Drag of 3.5 oz. at 400 mph. Wt. 1 lb.

FLIGHT CONTROL

AP-101E AUTOMATIC PILOT — Provides automatic pilot services in the heavy twin to four engine civil range. Flies the aircraft in response to heading signals during cross country

and localizer-glideslope signals (including crosswind correction) during approach.

AP-102 AUTOMATIC PILOT — Lightweight automatic pilot with service and installation range similar to the AP-101E.

AP-103 AUTOMATIC PILOT — Collins newest version automatically controls all high performance commercial and executive aircraft including airline and executive jets. Offers continuous radio course crosswind correction, smooth flight over VOR stations, included flight director steering computer circuitry.

FD-104 INTEGRATED FLIGHT SYSTEM — Provides instrumentation for attitude control, flight along selected headings or VOR radials, ILS approaches and flight director steering. Complete plan view and forward view picture of flight is presented on two instruments.

FD-105 INTEGRATED FLIGHT SYSTEM — Advanced version of IFS with two-color horizon background, 4" instruments, integrated lighting and larger warning flags.

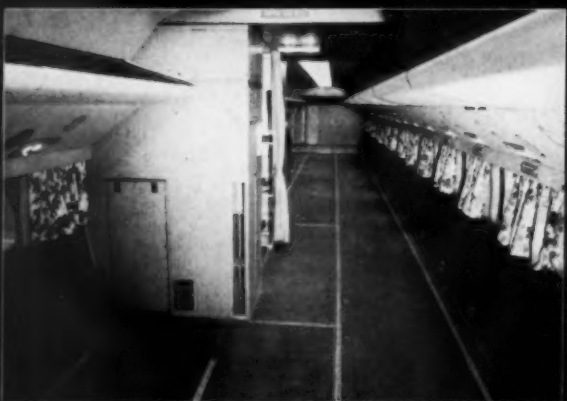
FD-107 INTEGRATED FLIGHT SYSTEM — Lightweight IFS utilizing 2" instruments of the FD-104. Computer amplifier in a 1/4 ATR short.



Movable bulkhead permits versatility in ratio of passenger-cargo space.



DC-6A cargo airliner converted to tourist seating arrangement.



Specially designed hat racks and cold air system quickly removable in sections.



Passenger windows added to cargo doors... installation of radar system, including radome.

Converting DC-6As Into Cargo-Passenger Airliners

AiResearch Aviation Service modifies to specific airline requirements

The cargo-passenger convertible DC-6A allows a change from full passenger to cargo-passenger configuration on three hours' notice, and full passenger to full cargo changeover in 24 hours. Literally three airplanes in one, it assures operators the best use of present equipment.

Modifications include installation of seats on tracks...galley and bulkheads designed for quick and easy removal...passenger lavatories and water systems.

Other major modifications for DC-6 and DC-7 aircraft include:

- Conversion from first class to tourist seating, or combinations of the two separated by a movable bulkhead.

- Radar installation including design of system and addition of radar nose...also radio, navigation and other communication and electrical systems.

- Extended range and increased gross weight of DC-6B.

- Performance of any required Douglas Service Bulletins.

Modifications have been performed for leading airlines including American, Canadian Pacific, Pan American, Japan, Hawaiian, Swissair, Sabena and others. AiResearch's more than 150,000 square feet of floor space represent the finest conversion, modification and servicing facilities available.

Your inquiries are invited.



AiResearch Aviation Service Division

International Airport, Los Angeles, Calif. • Telephone: ORegon 8-6161

Conversion and Modification • Custom Interiors • Electrical and Instrument • Radio and Electronics • Engineering Service • Turn-Around Service

Wanted: A Small Turbofan

On-again, off-again small Boeing and Douglas jets need engine in 7,000-to-7,300-lb. thrust class. Allison, GE, P&W and Wright are bidding on potential 800-plane turbofan market

By FRED S. HUNTER

FINAL DESIGN CONFIGURATIONS for the Boeing 727 and the Douglas DC-9 depend upon the choice of a new turbofan engine. This should come soon.

Four engine manufacturers—Allison, General Electric, Pratt & Whitney and Wright Aeronautical—are submitting proposals in response to requirements submitted by the two transport manufacturers.

These requirements are not identical. Contemplating a DC-9 having a takeoff gross weight of 94,000 lbs. growing to 105,000 lbs., Douglas sought a turbofan of approximately 8,300 lbs. thrust.

Boeing, on the other hand, had projected a smaller vehicle, 75,000 lbs. takeoff gross weight with growth to 94,000 lbs. For this, 6,300 lbs. thrust would have been about right.

But Boeing has been going up and Douglas coming down and latest information indicates Boeing can accept 7,000 lbs. thrust and Douglas 7,300 lbs. This puts them close enough together so that both can make use of the same type powerplant. This is highly advisable—if not downright necessary—because of the heavy costs involved in the development of a new engine without military support.

As things stand now, the military has no interest in a turbofan in the thrust categories required for the 727 or DC-9. In other words, all of the research and development and other costs involved would have to be fully covered in the sale price of the commercial engine. And the engine manufacturer winning the "competition" would have to be prepared to finance somewhere between \$75 million and \$100 million, which is what it would cost to develop the engine, and take the gamble of getting it back in commercial orders.

These should be substantial in the 1960s when the airlines may be expected to buy jetliners to replace their Constables, DC-6s and other propeller types, including, perhaps, turboprops such as the present Viscounts.

Market estimates run high

Some projections put the market potential at 800 airplanes. Others estimate as high as 1,200 during the span of the 1960s.

Both Boeing and Douglas appear to be resigned to the need for four engines for their 727 and DC-9 projects. Both sounded out the airlines on two-engine designs, but ran into resistance.

Similarly, Boeing and Douglas have found their potential customers insisting on turbofan engines because of their higher takeoff thrust and especially their greatly improved fuel economy.

Developing a new engine is a three-year or a three-and-a-half-year job. True, manufacturers such as GE and P&W would be able to make important use of parts of present engines, but no matter how many advantages you have, it

still takes time to turn out an engine with the reliability required for airline operation.

Thus the Boeing 727 and the Douglas DC-9 will be 1962 or 1963 airplanes, probably the latter, and this should be about right from many standpoints, including production schedules of the manufacturers, now occupied by the production of their big jetliners, and financing of the equipment by the airlines, now heavily burdened by their current equipment programs.

Both Boeing and Douglas have put in a great deal of work on their 727 and DC-9 projects. Many different designs have come off the drawing boards at both plants, particularly at Douglas. On the whole, Douglas has leaned toward a larger airplane with higher takeoff gross weight (it was once up to 125,000 lbs.), more seats (in the area of 85 for Douglas, 65 for Boeing), higher altitude cruise, longer design stage lengths.

But if one of the engine makers comes up—as anticipated—with a new turbofan that both of the aircraft manufacturers can accept, these differences will be minimized.

At Santa Monica and Seattle

Meanwhile, officials of both Douglas and Boeing kept it clear in the minds of potential customers that the small-jet projects are still alive.

In an annual report just off the press, a joint statement signed by Donald Douglas Sr. and Jr. indicates that final decisions on the DC-9 remain under consideration. "Further careful studies of the airline market, including the rapidly-changing economic as well as the engineering and manufacturing factors are now being assembled and evaluated, the report adds.

Concludes the Douglas team, "... research, development and engineering work on the DC-9 continues, so that whenever, in our judgment, the time for start of production of this new model is ripe, we can move with confidence and rapidity."

At Boeing, transport division chief engineer Maynard L. Pennell classes the 727 as a "nephew" more so than a brother in the so-called Boeing family of jets.

Says Pennell, "we have studied this airplane for some time and are continuing to study it since there is considerable evidence that there will be a market . . . in the future."

The problem as he sees it: keeping its size and cost down to the point where the airplane mile cost will turn out to be significantly below that of a medium-range airplane.

Concludes Pennell: "Given the proper engine (turbofan) for this kind of an airplane, I believe that the rest of the job can be done in such a manner that a real need of the airlines will be satisfied. Then all that will be required will be money, courage, and a customer."

Will CAB's 'Blank Checks' Bounce?

Abandonment of point-to-point principle in certification of carriers could lead to airline chaos. Speedup in freight investigation promises major changes.

By **WILLIAM V. HENZEY**
Contributing Editor*

THERE ARE revolutionary changes in store for the nation's airline industry quite independent of the revolution occasioned by the advent of jet aircraft.

This was evident in actions by the Civil Aeronautics Board recently in connection with the 8-year-old Large Irregular Air Carrier Investigation and the 9½-year-old experiment with all-cargo-type operations.

It is even more evident in actions not taken by the Government. For lurking in the background is a problem of super proportions which threatens to smother many of the advantages of the jet age. It is the continued isolation of individual problems of the industry, or focusing on one problem without recognizing its relation to other facets of the business.

The Government particularly has become adept at, or has fallen into the habit of, looking at individual problems in a vacuum. For example, whatever the merits of the Government's positions in the airways user charge increase matter and the General Passenger Fare Investigation, it is ironic that in one there is Federal sponsorship of airline fare increases and in the other Federal resistance to fare increases.

The case-by-case method in which new airline route awards are made presents a more specialized example. Confined in its rulings by the hard covers of a particular docket, CAB inevitably finds that new route awards will cause diversion of business from other carriers but "not unduly so." Sooner or later the agency will have to stop and add up the results of those individual findings to determine if the total amount of diversion so permitted will have, or is having, a crippling effect on carriers subject to it.

In its decision in the Large Irregular Air Carrier Investi-

gation, of paramount importance was the CAB majority's assertion that it could issue certificates for service not limited to any particular points but restricted as to the amount of service that may be provided.

Both phases of that finding go to the heart of the certification process which Congress adopted in 1938 to replace the then-existing chaos in the industry with stability.

If, for example, CAB has the power to issue a geographic "blank-check" to airline companies, it could well lead to erosion of the standard point-to-point route system on which our present certificated industry is based.

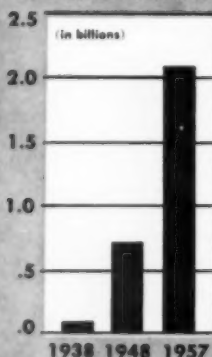
CAB's recent findings in the Large Irregular Case were on the so-called "fitness" phase of the two-pronged investigation. On November 15, 1955, the Board ruled on the so-called "policy" phase of the investigation. In the 1955 decision, the Board found that there was a place in the air transport system for Supplemental Carriers, but ran into trouble in the courts when it tried to implement that finding by issuing exemptions to the Supplementals.

Thus, there was a policy hangover when the agency ruled on the fitness phase this past January, namely, how to convey the authority it found the Supplementals should have. The answer of the three-man majority, Chairman Durfee and Members Minetti and Hector, was to issue certificates for operations anywhere in the United States provided no single company operated more than 10 monthly roundtrip flights between any pair of points. There was no limit on the number of pairs of points that a single company could serve, however.

The only geographic "limitation" was that the flights must be conducted in the United States. Never before in the history of air transportation has a certificate been

*Consultant, Air Transport Assn. and lecturer on air transport management, Georgetown University.

OPERATING REVENUE GROWTH



CARGO'S SNAIL-LIKE GROWTH

	1938		1948		1957	
	Operating Revenues	% Total	Operating Revenues	% Total	Operating Revenues	% Total
TOTAL*	\$57,998,000	100%	\$69,187,000	100%	\$2,116,380,000	100%
Passenger	29,296,000	50.5%	497,121,000	71.9%	1,730,719,000	81.8%
Mail	24,397,000	42.1	118,172,000	17.1	107,350,000	5.0
CARGO	1,840,000	3.2	16,102,000	2.3	126,333,000	6.0
Express	---	---	29,608,000	4.3	16,213,000	0.8
Other	2,465,000	4.2	30,876,000	4.4	135,765,000	6.4

* - All figures are for the total scheduled airline industry.

Notes: Mail totals include subsidy. In some cases freight and express revenues are combined in individual airline reports.

granted to a company authorizing service anywhere in the country it desires to fly.

The issue of CAB's authority to grant such certificates far transcends the many other issues involved in the long and stormy Large Irregular Case. Actually, the Board itself has been quite skeptical that it possesses such authority.

Thus, each year for a number of years, the agency has requested Congress to pass legislation to "clarify" its authority in the matter of issuing certificates. To date there has been no such legislation passed.

Two of five doubt authority

Also, in the January decision, the CAB majority emphasized the doubt that exists by stating that if its decision to issue the new type certificates to the Supplementals fell, it would promptly issue exemptions. In addition, Vice Chairman Gurney and Member Denny, in a joint dissent, disagreed with the majority's interpretation of the Board's lawful authority.

Airline attorneys point to a legal "inconsistency" in the issuance of geographic "blank-check" certificates. The Federal Aviation Act requires that public convenience and necessity must be proved to issue a certificate for a new service. Actually, the formal title of a certificate is "Certificate of Public Convenience and Necessity."

The point the lawyers make is how can you prove public convenience and necessity for all points in the United States at the same time in the same case.

In any event, the CAB has been chipping away for years at the legislative limitations on its certificate-issuing authority. Original certificates to the domestic trunks and local service airlines were limited to point-to-point routes but not limited as to type of traffic or amount of service to be offered.

In the 1949 decision awarding certificates to all-cargo carriers, however, the agency issued certificates for service between areas of the United States (although points within each area were named) and limited the traffic to be carried to airfreight.

In granting certificates to the three helicopter lines in Los Angeles, Chicago and New York, CAB limited the service to rotary-winged aircraft and the traffic to mail, although currently there is no limitation on traffic.

Precedent sets the stage

The CAB majority relies on these variations of the standard certificate authority to support its all-out move in the Large Irregular Case.

If it is sustained in its belief that it can issue certificates with geographic "blank-checks" or can specify the number of flights that a certificated carrier can operate, the door will be opened wide for a new and seemingly incomprehensible structure for our air transport system.

Meanwhile, attention will soon be focused on the airfreight field and the flexibility which CAB may possess in the issuance of certificates may have a strong bearing on the future course of air cargo development.

Always long on potential but never quite living up to expectations, airfreight now accounts for about 6% of total industry revenues. The subsidy petitions of several all-cargo lines has, according to CAB, "raised grave questions as to the soundness of continuing the experiment in its present form."

The cargo experiment was launched in 1949 when CAB awarded temporary certificates to Slick Airways, The Flying Tiger Line, U.S. Airlines, and Airnews, Inc. Of the four, only Flying Tiger is still carrying traffic under its cargo certificate. Slick has suspended common carrier cargo service; U.S. Airlines failed to gain renewal of its certificate; and Airnews abandoned its certificate in the first year.

Others have come into the field since, however. Domestically, Riddle Airlines and AAXICO Airlines are operating under cargo certificates and in the international field Seaboard & Western Airlines and Aerovias Sud Americana are doing the same. Riddle also has overseas rights to and from Puerto Rico.

In ordering an expedited investigation "for the purpose of evaluating the all-cargo experiment," CAB has laid a framework which promises major changes in the potentially dynamic freight field.

There is the obvious question, of course, of whether Federal subsidy will be granted to further the development of the cargo lines and the airfreight business in general.

There is also the possibility of discontinuing all-cargo carriers altogether and, conversely, taking away the present cargo rights of the domestic trunks and transferring them to all-cargo carriers.

These are all issues of far-reaching importance if, as many in the industry believe today, air cargo will eventually become the dominant source of revenue for the airline industry.

Somewhere, however, the degree of interrelation between the decision in the Large Irregular Case, the new cargo investigation, the diversionary impact of competitive route

CAB found awards in each of these major cases would cause diversion of business:

- New York-Chicago Case
- Denver Service Case
- Southwest-Northeast Case
- New York-Florida Case
- Great Lakes-Southeast Case
- Large Irregular Investigation

Total Diversion: ?????

awards, etc., must be observed for the preservation of a sound industry.

The same is true in the international field. It seems to make little sense for this country to steadfastly recognize a foreign country's pride in its native airline and grant extensive U.S. routes accordingly, only to have the foreign carrier scamper away from the bilateral session to pool its operations with other foreign carriers to better compete with U.S. flag lines.

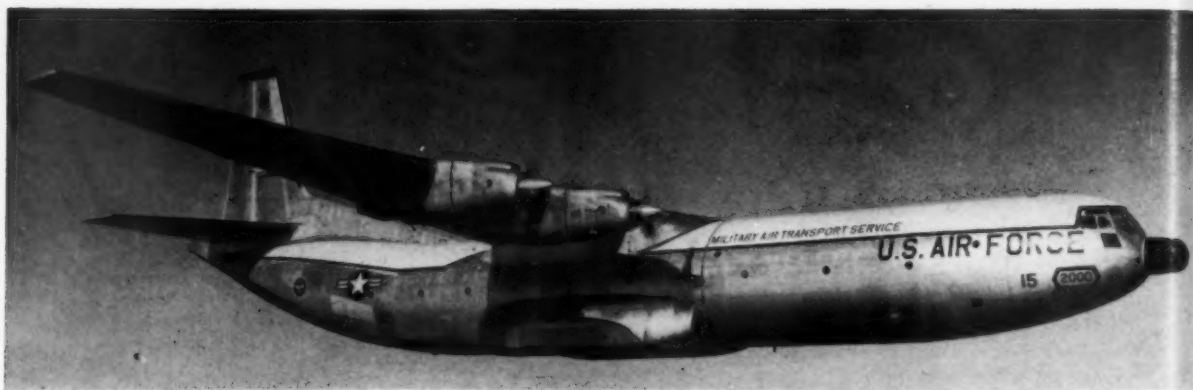
In this respect, the time has long since passed when the Government can look at foreign international airlines without weighing the impact of their service on the domestic U.S. lines.

The industry's problems are finding less leg room for solution on an individual basis.

No exception is the aviation political arena centering around appointment of CAB members. For most of the Board's 20½ years of existence, a recurring complaint has been the difficulty of attracting men of high caliber to what are usually thankless jobs.

Yet, because one Commissioner of another regulatory agency got involved in a scandal, the aim today is to make it even more difficult to attract qualified men by imposing embarrassing codes and severe criminal penalties for offenses that would never exist if quality were the keynote of selection.

CAB has been visibly relegated to a secondary role in the public's eye through the widely-publicized creation of the Federal Aviation Agency. Yet the multi-billion dollar air transport industry's economic problems are mounting unceasingly. The need was never greater for more than secondary consideration.



Douglas Cargomaster, latest addition to MATS fleet, is capable of airlifting all IRBM and ICBM systems.

The C-133...Answer to Berlin Crisis

It can carry 50 tons 1,000 miles or 20 tons 3,500 miles, making the Atlantic a nonstop hop.

By JOE DRAPER



Conveyor Belt moves supplies into C-133's hold.

WITH THE ATTENTION of the world focused upon Berlin and the possibilities of another blockade, the big question is, can the U.S. do it again with airlift?

The answer: a definite Yes, faster, easier and much cheaper than we did in 1948 with scores of C-54 type aircraft.

The reason: Military Air Transport Services' newest (and only) addition to the cargo fleet since the days of the 1948-49 Berlin airlift. It is the Douglas C-133 Cargomaster powered by four Pratt & Whitney T34 turboprop engines.

First flown in 1956, the C-133 is capable of airlifting more than 50 tons for a distance of 1,000 nautical miles. On longer hauls, it can carry more than 20 tons over 3,500 miles shrinking the Atlantic to a nonstop hop and returning from the Pacific with only one refueling.

During the original Berlin Airlift, when more than two and one half million people had to be kept alive solely by airlift, Major General William H. Tunner, commander of the Airlift Task Force (and now Lt. Gen., commanding MATS) said it required 178 C-54s flying 13,800 trips per month to supply the required 135,000 tons for Berlin.

Today, the same tonnage can be carried by 10 C-133s carrying 50 tons each in 270 trips per month.

The giant turboprop was first delivered to MATS in August 1957 and, since that time, only 18 of these aircraft have been received. One was demolished in an accident at Dover AFB, Del. in 1958, placing the total at 17 modern airfreighters in service today.

In addition to the 10 at Dover, seven C-133s are currently assigned to the 84th Air Transport Squadron at Travis AFB in California and have just recently started rewriting the airlift book in that area.

Although the C-133 has been in Air Force squadrons for a little less than 18 months, they are still being used only as special mission aircraft and have not been placed on scheduled operations. Their current task is the priority movement of intercontinental and intermediate range ballistic missiles from the factory to the testing site at Cape Canaveral, Fla. and other destinations.

For this task, the C-133 is the only aircraft in existence that can carry our largest ICBMs and the IRBMs complete. Their sister ship, the Douglas C-124 has been carrying missiles in a disassembled state and in various parts. Now for the first time, the entire Atlas, Thor, Titan and others in the missile inventory can be transported to any spot intact and ready for immediate placement on the firing pad.

Prior to the C-133, the Atlas missile, for instance, was transported by truck and trailer from San Diego, Calif. overland to Cape Canaveral. This trip took some 14 days and cost about \$14,000 per trip, excluding the cost of all the security personnel. By using the C-133, the trip can be

completed in less than seven hours at a total roundtrip cost of \$9,200.

While performing the special missions, the C-133 also is being used on both east and west coast to familiarize the personnel with handling the new giant and to provide proficiency training for the flight crews and mechanics.

On one such trip, during late January and early February, a Travis C-133, made an 18,000 mile survey flight of all possible MATS routes in the Pacific area. Leaving Travis and stopping at Hickam; Wake; Tachikawa Air Base, Japan; Kadena, Okinawa; Clark Air Base and Manila, Philippines; Guam; Midway and then direct back to Travis on a non-stop flight, eliminating the usual stop at Hickam.

The entire flight consumed some 70 hours and there were no major write-ups for maintenance. On the entire trip, the aircraft made arrival and departure schedules previously established at Travis.

Biggest lift to Hickam

The survey trip was completed on a Wednesday afternoon, and the following Monday a record 55,000 pounds of cargo was flown to the Pacific over the same routes. This is the largest load ever carried over the Travis-Hickam leg in the history of MATS.

After reaching Tachikawa and shuttling to Kadena in Okinawa, the aircraft returned to Travis. At Hickam, the Douglas Cargomaster proved its name by carrying 71,000 pounds of freight back to Travis.

Comparing the productivity of the new airfreighter with the older C-124, it can carry more than two and one-half times the payload of the older aircraft, carry it farther and a third again as fast. The big difference between the two aircraft is versatility. With the C-124, many things, such as the big missiles, are just not air transportable. With the C-133, more than 95% of all the heavy equipment the military owns can be airlifted.

By 1961 MATS will have an estimated 143 C-124 type aircraft still in its cargo fleet. Using the demonstrated performance of the C-133 Cargomaster, this entire fleet of 143 C-124s could be replaced by 36 modern aircraft.

The C-133B is a newer version of the A model with slight increases in range, speed and payload. The first model is just now coming off the production line.

Other airlifts that offer a possible comparison between the two aircraft are the recent hotbeds in both Lebanon and the Far East.

With 36 C-124s in position at Rhein-Main Air Base in Germany, the Far East operation required 51 aircraft to deploy to the Philippine area with troops and military cargo. During the first two weeks of this operation, MATS made 150 trips to the Far East in support of combat forces.

Each aircraft carried an average load of 14 tons for a total trip of about 6,000 miles. Had the C-133 been available in sufficient numbers and in operation, the same tonnage could have been airlifted in only 81 trips and in one third less time per trip.

With the small number of C-133s in the inventory at the present time, an exact date for scheduled operations in either the east or west is uncertain. However, once they are available in quantity, the overall cost of air transport

will take a nosedive and the overall effectiveness of air logistics will be increased manifold.

In the Pacific area alone, the C-133 will better by close to 15 hours the roundtrip flying time of the C-124, eliminate a stop or two and carry more than twice the amount of cargo while it is doing it.

One estimate made in the Pacific area is that once the Cargomaster is placed in schedule to work, a savings of more than \$13 million yearly will be realized over the C-124 operation in that area due strictly to the increased productivity.

In the Eastern operations, the turboprop giant has made the Atlantic a short hop operation and in the first flight across the Atlantic from Dover AFB to Chateauroux, France, a C-133 carried a payload of more than 20 tons nonstop. The 3,890 nautical mile trip was made in 10 hours and 21 minutes. For logistical planners, this feat eliminates one of the biggest problems facing the support of our troops in Europe if we ever lose the Atlantic island refueling stops.

The C-133 is the first true logistics airplane. It has been

—HOW USAF'S BIG CARGO PLANES COMPARE—

Dimensions	C-124C	C-133A	C-133B
Length	130.1 ft.	157.5 ft.	157.5 ft.
Height	48.2	48.3	48.3
Wingspan	174.1	179.7	179.7
Cargo-Comp't-length	74	97	97
Height	139 in.	144 in.	144 in.
Width	136	142	142
Volume	10,450 cu. ft.	13,028 cu. ft.	13,028 cu. ft.
Cargo Floor Height	157 in.	50 in.	50 in.
Cargo Ramp Angle	17 deg.	9 deg.	9 deg.
Weights			
Design gross	185,000 lbs.	275,000 lbs.	286,000 lbs.
Design Max. Cargo	56,286	94,993	91,279
Cargo for 3,500 N. Mi. Range	16,750	42,395	51,845
Productivity			
Ton Knots at 2,000 N. Mi. Range	3,530	11,050	12,640
Average Cruise Speed—Knots	187	271	285
Cost			
Per Ton N. Mi. at 2,000 N. Mi. Range	10.5¢	6.0¢	5.5¢
Powerplants	P&W R4360	P&W T34	P&W T34
Total Power	15,200 hp	28,000 eshp.	30,000 eshp.

designed specifically for airfreight requirements and will become the very backbone of the USAF airlift system.

In USAF operation to date, the big turboprop has been grounded on three separate occasions. The first, in April 1958, was precautionary, pending investigation of an accident; the second, in June 1958, resulted from failures of the tailpipe to main engine clamp joint. The joint was eliminated from the installation. Most recent grounding in January 1959 stemmed from chafing of electrical insulation, called for inspection and correction wherever found.

At the close of the Berlin Airlift in 1949, the late Gen. Hoyt S. Vandenberg, then USAF Chief of Staff, said: "It (the Berlin Airlift) has convinced us . . . that we can fly anything, anywhere, anytime and that the future of military air transport is in big aircraft."

From all the performance records since the first C-133 was delivered, the C-133 is THE big aircraft for military airfreight, in a future Berlin Airlift, a small brush fire outbreak, or even in case of general war.

It is the only vehicle in the entire defense establishment capable of getting the job done.

ABOUT THE AUTHOR

18. "Joe" Draper, recently retired chief of information services for MATS Western Transport Air Force has been closely associated with turboprop airlift operations for the past five years. In 1954, with MATS Continental Division, he handled public information activities for the testing of three turboprop testbeds, the Convair YC-131C, Boeing YC-97J and Lockheed YC-121F.



Designer Butler at drawing board.

What's Wrong With

Passenger comfort has been given a back seat by both transport manufacturers and airlines. Interior designers are seldom brought into the act until after the airplane has already been "engineered" beyond the hope of real benefits.

THE NEXT TIME you're sitting in a commercial airplane, any airplane, look around you—think back to the days of 1935 and the DC-3. Do you see almost 25 years of progress in passenger comfort?

The chances are you won't. From these reliable old timers to the sleek, modern jets of today, there is a dreary similarity in the concept of what should go into the interior. The same round fuselage, somewhat larger; the same old hat rack, streamlined but essentially the same. Cold air outlets and passenger reading lights, still fixed in the same position, annoying everyone except the passengers using them.

The height, width and length of these "modern" transports have changed. Colors and materials have changed too. Essentially, though, the same tired philosophies are still with us. Why has so little progress been attained in comparison to what might have been done? Who is to blame for the snail-like progress over the years?

First, and mainly, let's lay a goodly share of blame at the door of the airframe manufacturer. After all, he provides the basic airplane for the airlines which, in turn, offer it to their passengers.

Since the purpose of the vehicle is to carry people for a profit, the aircraft should be designed around people, with painstaking attention to their needs and comforts. No aerodynamic shape is so perfect that it cannot be modified to conform to its primary purpose.

A nearly perfect machine, but . . .

The manufacturer's engineering groups create what is, to them, a nearly perfect machine. Only then do they begin to figure out how to pack the passengers and the required utilities into the usable area.

They decide the location of the ducting for air-conditioning, re-circulating warm and cold air, electrical conduits, and so on. Once these decisions are made, they often close the door forthwith on any improvements suggested from others who are skilled in the imperatives of passenger service.

The most important element in the initial abuse of an airplane's interior design is the section of the fuselage

whose shape is dictated by the location of the vital passenger utilities. It's at this crucial point that a reputable interior designer, who knows what he's about, should be brought into the picture to work closely with the engineering group.

Only from the happy wedding of design and engineering can fresh new concepts of aircraft interiors emerge.

A good interior designer has the advantage of bringing in an objective outside viewpoint, coupled with a knowledge of new materials and their applications. He is not "institutionalized." He is not obliged to submit to the whims and notions of a chain of superiors who may know relatively little about passenger convenience in air transport.

I recently had a conversation with a heating and ventilating engineer who was trying to dictate the location of cold air outlets for passenger use. On checking further, I found the gentleman had a vast experience to draw from. He had made exactly *four* commercial flights in his life and short ones at that.

The extreme example, ducting

This may be an extreme example, but how many airplanes have come off the line with their hot air outlets illogically positioned up in the ceiling where they do practically no good, instead of being located near the floor where they can warm the customers' chilly ankles.

Only by creating an "ideal section" incorporating all of the utilities, can we ever hope to achieve a new look. For example, that cumbersome overhead mass, the hat rack, represents hundreds of pounds of additional—and expensive—weight just to carry hats and coats, blankets and pillows and a few passenger service items, the reading lights, cold air, call buttons, and, depending on the aircraft, emergency oxygen equipment.

On U.S. airlines it is not permitted to place heavy articles in the hat rack—and wisely so. On some European lines that have a more laissez faire policy, I have seen more than one cranium dented by falling strong boxes. If we could only handle passenger service utilities in a different manner, the need for the hat rack would be greatly diminished. It might shrink in size and, possibly, disappear.

Aircraft Interiors

By **CHARLES BUTLER**
President,
Charles Butler Associates

I like to note though that Douglas, with the new DC-8, has made a sound contribution to the hat-rack problem with their positioning of all essential passenger utilities into the seat. Perhaps this is not the best final solution but the concept is a welcome change, indeed.

In some cases, a manufacturer will retain a designer, and figuratively speaking, stick him off in a corner to play with color and material swatches until the engineers have made their irrevocable decisions and then expect him to do a face-lifting job.

Why not bring the designer in at the outset, so his contributions can be built into the basic aircraft? Too frequently, the interior designer is merely tolerated as a necessary evil.

I should say, however, that about a couple of years ago, my firm had the pleasant experience of being retained by an aircraft manufacturer *before* the basic airplane plans were actually finalized. The resulting aircraft clearly benefited by the experience of our representative who lived with the job for almost a year. This practice, unfortunately, is not common enough.

After the engineering groups have designed an airplane, the important facilities like galleys, lavatories and wardrobes are placed in the "left-over" areas. But if these necessary passenger service items have not been properly designed to harmonize with the fuselage, it will cause the operator much grief and money during the life of the airplane.

ABOUT THE AUTHOR

Industrial designer Charles Butler needs little introduction to the air transport industry. His interior designs have been tailored to the tastes of kings, corporations and airlines both in the U.S. and abroad. His most recent "big job" is an interior of the British VC-10 jet transport for Vickers-Armstrongs, Ltd. As president of Charles Butler Associates, with offices in New York, London and Minneapolis, Butler has ample opportunity to expose himself to the user side of aircraft interiors. He has flown the Atlantic 114 times, annually logs more than 150,000 miles in the air.

Then, too, the designer is approached and asked how many passengers he can squeeze into the airplane, what can he do to eliminate the long, extruded tubular look of the cabin. At this point the answer is "Nothing." It's too late in the game.

Airlines, too, must accept a proportionate share of blame for mediocre designs. It is common practice, in purchasing an airplane, to select a group from engineering to write a set of specifications covering the aircraft from stem to stern.

Nowadays, most airlines have passenger service and marketing departments. These groups are day-by-day naturally alert to the needs and comforts of passengers and what it takes to wean a passenger away from a competitor.

But how often are these knowledgeable people brought into the picture in the early stages? Rarely, and when it comes to designing and styling the decor for the airline, this is the time that everybody gets into the act—sometimes even the president's wife.

When you undergo an appendectomy, you don't presume to supervise the doctor performing the operation, so why "expert" a qualified designer who is eminently capable of producing an individualized interior and creating a personality for the airline?

As things now stand in the industry, you mostly have a multitude of decisions made by the so-called "experts," often resulting in a "nothing" interior. In my opinion, the engineering group, the passenger service and marketing people, and the interior designer should work together from the very beginning in creating the ultimate for the passengers and, concomitantly, an identity for the airline.

It seems absurd to take an airplane off the line whose basic interior has already been conceived by mainly engineering minds, and then turn to the designer and expect him to do the impossible with vinyl, colors and fabrics.

Sometimes, a real understanding

On the other hand, one of our favorite clients is an airline president who is vitally interested in merchandising and who has a real understanding of what it takes to provide the outstanding in passenger appeal.

Unfortunately, personalities like this are in the minority and a good many executive officers pay much less attention than they should to interiors—they just wonder why their load factors decrease.

But while we're distributing blame, let's not forget the interior designer, either. Even if the designer is given the proper opportunity to participate from the beginning, he must have a number of capabilities. He should certainly understand the nature and characteristics of the structure of the airplane itself and how it is put together.

He must have an understanding and respect for the engineering and manufacturing problems concerning the many items that are contained within the shell. He must be aware of the performance of the airplane, its average and most profitable stage length.

Regrettably, at times, designers are retained who have little or no knowledge of the manufacturing and operating problems, and they care even less. What results is generally an interior decorator's delight.

The field is being invaded by interior decorators who profess to be able to create all sorts of results by simply using colors and materials. While this is, no doubt, important and has its place, I am afraid the place is down toward the end of a long, hard trail.

There is no reason why we cannot sensibly depart from the old methods and materials and start to catch up with the times. I refuse to believe that passengers are not constantly aware of their surroundings and atmosphere in airplanes.

When the manufacturers and the airlines finally realize this, then, and only then, will we see real progress.

New Air Battle Over Pacific

**Eleven U.S. airlines to fight
for overseas routes as result
of Ike's order for CAB probe**

A MAJOR, bitter battle for air routes looms in the Pacific.

The stage has been set by:

1. An unusual White House move—an order to the Civil Aeronautics Board to investigate the entire Pacific air route complex and give recommendations to the President as soon as possible.

2. A push by two foreign flag lines—British Overseas Airways Corporation and Qantas Empire Airways—for expanded traffic rights.

At least 11 U.S. airlines will be involved—some of them domestic carriers that heretofore had given little consideration to overseas operations. The routes sought stretch from the U.S. east coast to every conceivable Pacific point.

It adds up to the fact that attention is now on the Pacific. It has been focused there primarily by the White House move. BOAC and Qantas complicate the situation. It will be one of the biggest route cases in years—one that may even overshadow the upcoming southern transcontinental fight.

How did it start? The background: Northwest Airlines' authority to serve Okinawa, Formosa, Hong Kong and the Philippines and Pan American's right to serve Tokyo via Honolulu expire in 1960. This would probably have resulted in a fairly routine CAB renewal case next year.

But, in February President Eisenhower, noting these certificate expirations, directed CAB to investigate and make recommendations covering the entire Pacific. No previous President had ever ordered the Board to start a major route investigation.

"As you are aware," the President told CAB Chairman James R. Durfee, "this Administration is firmly committed to the view that the public interest requires competitive American flag service at the earliest feasible date on all inter-

national air routes serving major U.S. gateways. Over the North Atlantic our objective has been substantially achieved, but in the Pacific, because so far it has not been deemed feasible, very little progress . . . has been made."

It was these statements that started a flood of route applications. At the time of the President's action, renewal and new route applications were on file by PAA and NWA. Transocean and the Flying Tigers were seeking Pacific authorizations.

But following the President's directive, the case ballooned, with requests being received in rapid-fire order from Hawaiian, Continental, Western, Seaboard & Western, TWA, South Pacific Air Lines and Alaska Airlines.

Interestingly, Hawaii will officially be the 50th state long before CAB's decision in the case. This will mean that the White House, which has power to review and change international decisions, will have no say about routes granted or denied between the mainland and Hawaii.

Two touchy international situations add to the Pacific battle. Qantas, which flies from Australia through Honolulu to San Francisco, across the U.S. to New York, on to London and around the world back to Australia, aims to carry international passengers between U.S. domestic points, even though it did not bring these passengers into the U.S. or is scheduled to take them out. Examples: a passenger arriving in San Francisco on Japan Air Lines and destined for New York should be allowed to ride Qantas across the U.S. Or, a passenger originating in San Francisco, planning to cross the U.S. and fly to London on BOAC, could use Qantas to New York.

U.S. domestic lines are up in arms, stating that no foreign line is entitled to carry this traffic. CAB now has the dispute for decision.

Potentially even more explosive is the BOAC case—which may even result in a Congressional investigation. Under the U.S.-British civil air agreement, BOAC is allowed to fly a New York-San Francisco-Honolulu-Guam-Wake-Midway-Hong Kong route—which it is now ready to operate. Two years ago, the British informed the State Department that they were adding Tokyo to the route. This is allowed, they said, under Sec. IV(b) of the air agreement, which provides that points can be added if the other government is notified. However, the pact states that such points are to be of "limited significance."

Neither State Dept. nor CAB objected to addition of Tokyo. But Northwest is violently opposed, claiming that Tokyo, which it says is the gateway for over 80% of transpacific air traffic, is far from being a "minor" point. Its addition, in effect, gives BOAC an entirely new Pacific route, NWA says.

NWA promises a fight to the finish on Tokyo. And Rep. Steven B. Derounian (R.-N.Y.) is demanding a Congressional probe of the failure of CAB and State to protect the rights of U.S. carriers.

WHO WANTS WHAT

Northwest Airlines: Renewal of Pacific routes and addition of Chicago, Los Angeles, San Francisco, Seattle and Portland as co-terminals; add as intermediates Hawaii, Wake Island, Guam, Japan, Korea, Okinawa, Taiwan, Philippines, Hong Kong, China mainland, Thailand, Viet Nam, Singapore, Java, Australia, and terminals in New Zealand.

Pan American: Renewal of Pacific routes, addition of Boston, New York, Philadelphia, Washington/Baltimore, Detroit, Chicago, Seattle, Portland, San Francisco and Los Angeles as co-terminals; add Moscow as a co-terminal with its India and Pakistan co-terminals north of the 20th parallel; add Fairbanks and Okinawa as intermediates; Society Islands and Australia as intermediates on present route, which should be extended beyond Australia to Java.

Hawaiian Airlines: Los Angeles, San Francisco, Portland and Seattle to (1) Hawaii, (2) Australia via Hawaii, Society Islands, American Samoa, Fiji, New Caledonia and New Zealand, (3) Hong Kong via Hawaii, Midway, Guam, Japan, Korea, Philippines, Okinawa and Taiwan, and (4) from Honolulu to Juneau, Anchorage and Fairbanks.

TWA: Renewal of present Bangkok, Thailand and Manila rights, with Hong Kong added.

Western: San Francisco and Los Angeles to Honolulu and Hilo.

Continental: San Francisco and Los Angeles to Hawaii, nonstop rights from Honolulu to Chicago, Denver and Kansas City.

South Pacific Air Lines: Society Islands and Hawaii to San Francisco and Los Angeles; Society Islands to Fiji.

Transocean: Los Angeles, San Francisco, Portland and Seattle to Honolulu, numerous Pacific and Far East points, and to Alaska.

Alaska Airlines: Consolidation of pending applications for Alaska-U.S. routes, whether or not such services are part of longer-haul Pacific routes. Seeks to add Los Angeles, San Francisco, Reno, Las Vegas, New York, Chicago, Twin Cities.

Seaboard & Western: Cargo rights to numerous Far East points from Los Angeles, Seattle, Portland, New York, Philadelphia, Baltimore, Chicago and Detroit.

Flying Tigers: Cargo and mail rights from San Francisco, Los Angeles, Seattle, Portland, Chicago and Detroit to Japan, Hong Kong and Taiwan via Hawaii, Wake Island and Guam.



CHA'S Angstadt

Helicopters Make Big Bid To Grab Share of Traffic

By DE WITT BALLEW

HELICOPTERS FLYING today, not those of the what-can-be-done-when-available variety, offer a sound solution to one of the biggest gripes nursed by the average air traveler, that of traveling between city and airport.

Coping with clogged streets in downtown city centers and then fighting highways that are jammed bumper-to-bumper with other motorists is the big bugaboo of the average airline passenger. This is a situation that is rapidly getting worse instead of better.

The disparity between ground time and air time will continue to grow. The introduction of turboprop aircraft has shrunk in-flight time 16% to 20% and on those routes being flown with turbojets time in the air has been cut a whopping 40%.

But only in three American cities, Chicago, New York and Los Angeles, is the problem of surface travel delays being met. In these three cities scheduled helicopter airlines are providing schedules between the city centers and airports that are amazingly successful. And operationally, they show a record that compares favorably with both local service and trunk carriers.

One thing that is aggravating the situation is that airports are getting farther and farther away from cities. For instance, Washington, D.C.'s National Airport is only a few minutes from the heart of the city. But, as jet service is inaugurated sometime this month, Washington will be served through Baltimore's Friendship Airport, about 30 miles away, by these new aircraft. And later, when construction is completed on Chantilly Airport about 25 miles away in Virginia, jet service will be moved permanently there.

No doubt as to future

These ever-increasing distances and the achievements of the three scheduled U.S. helicopter airlines leave no doubt of the role which will be played by the helicopter between city center and airport.

R. S. Angstadt, vice president of operations for Chicago Helicopter Airways, cites his own airline as one example of how readily helicopters are being accepted. He says that in Chicago the air traveler's response has been immediate and overwhelming. He points out that passenger originations in the second quarter of 1958 exceeded the previous quarter by 31%. Growth during the third quarter was 27%.

Angstadt's airline operates clockwise triangle flights which originate at Midway Airport every hour on the hour, proceed to O'Hare, downtown and return to Midway. Counterclockwise flights originate at Midway every hour on the half hour, proceed to downtown Chicago, O'Hare and return to Midway.

Turn-around time—or time spent on the ground—at O'Hare and downtown is two minutes in each case. Under

present schedules, the helicopter easily covers this 42-mile triangular route in 35 minutes. Ninety-two individual flights are made daily between the triangle terminals and in addition the suburban communities of Winnetka, Ill., and Gary, Ind., are linked to the triangle.

Angstadt points out that although the helicopter trip is more expensive than limousine service, it compares very favorably with taxi service. For instance, the taxi rate from Midway to O'Hare is \$7.00. By CHA the cost is \$6.60. From O'Hare to downtown Chicago the taxi bill comes to \$6.50, while the cost via CHA is \$6.60. On the other side of the ledger, the charge for a taxi from Midway to Chicago's downtown section is only \$3.25, some \$2.50 cheaper than the helicopter flight. But in all cases cited, taxi fares range higher than shown, depending on traffic conditions and the route taken.

Big edge over taxis

Helicopters show up even more favorably when compared with taxis on a time consumed basis. Here the rotary wing aircraft are in their element. A taxi trip from Midway to downtown Chicago eats up 40 minutes, while the same trip can be made by helicopter in 9 minutes. And a trip from O'Hare to Midway via taxi takes an even hour, while the same jaunt by helicopter takes 11 minutes.

Shown in accompanying Chart I is a comparison of revenue helicopter passenger movements between Midway Airport and downtown Chicago per 10,000 airline passenger movements at Midway. The figures on this chart reveal that the helicopter held its own during the general traffic slump at Midway during late 1957 and early 1958. It also shows that city center helicopter passenger rate increased 33% during 1958's third quarter even though airline movements at Midway during this quarter were still well under the previous high of 1957's third quarter.

The growth that Chicago Helicopter Airways has achieved in passenger traffic over the Midway-O'Hare segment since service was inaugurated in late 1956 is shown in Chart II. A comparison of the trends shown in Charts II and III shows the total number of direct and "via downtown" seats available with the number of seats actually used. As Angstadt points out, the rate of traffic growth is well ahead of the rate which seats are made available.

The speed and convenience of helicopter service is so great that 37% of Midway-O'Hare passengers gladly ride along on flights which serve the other two sides of the triangle.

Angstadt is even more enthusiastic when he compares the performance of scheduled helicopter service with the performance of the local service and domestic trunk lines.

Since CHA began operations, it has run up a performance record of miles flown as a percent of miles scheduled

CHART I—CHA's 1957-1958 Passengers

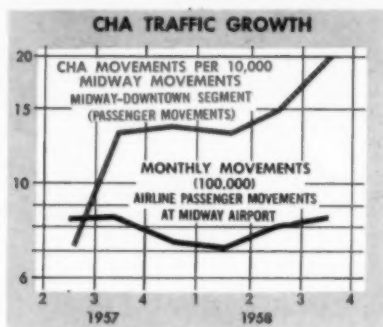


CHART II—Steady Passenger Growth

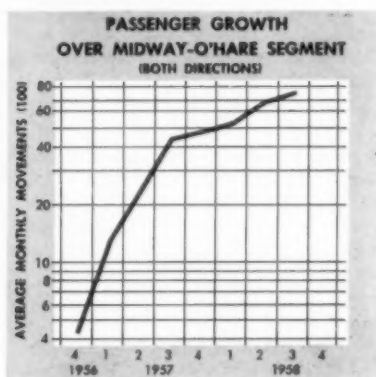


CHART III—CHA's 1958 Seats Utilization

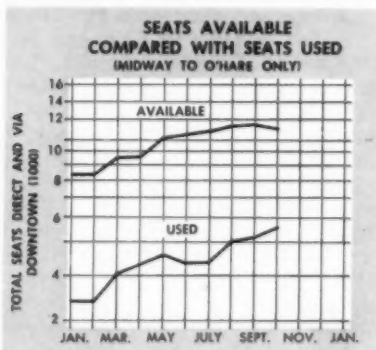
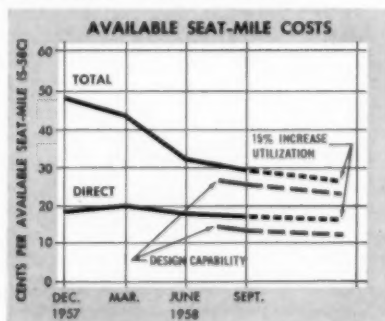


CHART IV—Down Trend of Costs



that has averaged 93.7%. This is lower than the average for local service airlines, which is 96.9%, and under the trunk lines' 96.4%, but it is particularly enviable when considered in the light that commercial operation of helicopters is a relatively new thing compared to the extensive experience the airlines have compiled with their fixed-wing aircraft.

This record is also complimentary in view of the fact that present helicopter performance levels are based on visual-flight capabilities only.

Another point Angstadt makes in boosting his helicopter carrier is the "on-timeness" of CHA flights. Picking last October for what might be termed a typical month, he points out that 40% of all arrivals were exactly on time and that only 8.1% were more than 5 minutes late. This punctuality is especially significant in view of the fact that 30% of the helicopter movements analyzed occurred at the world's busiest airport.

Although the many achievements of CHA's helicopters lend themselves to a highly favorable future, perhaps no one factor is more convincing to stockholders and operators than the seat mile cost-levels the carrier has achieved. Last September's costs were 29¢ per available seat mile, breaking down into 17¢ direct and 12¢ indirect as shown in Chart IV. Yield per passenger seat mile during the month was a shade better than 32½¢. Throughout its brief operating history, CHA has steadily reduced both direct and indirect costs and based on S-58C figures is now nearing Sikorsky's design capability for the aircraft.

Better utilization coming

Present schedules require only a portion of the total utilization of the capacity inherent in the present fleet of S-58Cs. Increase in service early in 1959 will require at least the 15% increase in fleet utilization shown in the chart. Assuming no significant change in airframe and engine costs, this utilization increase will further reduce the total available seat mile costs to 27¢, 16¢ direct and 11¢ indirect. Further, CHA firmly believes that higher utilization levels can be beneficially increased by an additional 20%.

One further factor to be taken into consideration, if present helicopter costs are to be put in a proper perspective, is that CHA's S-58Cs have a design capacity for two or three more seats than the present 12. As these aircraft are used, they have a weight lifting ability that far exceeds its cubic capacity. With the present configuration, 99.5% of so-called loaded flights, all seats occupied, can accommodate 600-700 additional pounds of payload. And 96.4% of these fully loaded flights have 700-800 pounds of such unusable payload capacity.

With fuselage modification to a 14 seat configuration, Angstadt figures that seat mile costs could be brought down to 23¢ and that a 70% load factor would be about the break even point.

Another interesting factor is CHA's cost/yield ratio of .82 and an imminent reduction in this to .70. These figures compare favorably with the 1957 record of local service carriers. During this year, these carriers experienced average total costs of 5¢ per available seat mile and a yield of 6.8¢ per passenger mile, or a cost/yield ratio of .72. This makes helicopters look good.

Highly satisfied with the present, Angstadt says this of the future: "As larger and more productive designs come into being, the benefits of present helicopter services will grow and expand into a widening range of markets. Impressive improvements in performance and economy will follow the introduction of turbine-powered types . . . All point conclusively to the great role in which the transport helicopter has been cast."

British Independents Push BOAC, BEA

By ANTHONY VANDYK

LONDON—The British independent airlines have progressed so rapidly in recent years that they are now carrying about three times as many passengers as BOAC and half as many as British European Airways.

Latest statistics indicate that the independents' passenger traffic is growing at twice the rate of that of the nationalized airline corporations. And the plans of the independent airlines suggest that this pace will continue unless the British government steps in to "protect" its two corporations.

From the independents' side of the fence the British government has always put a brake on their progress. T. W. Morton, president of the British Independent Air Transport Association, refers in the trade group's latest report to "restrictions and limitations on expansion." But Lord Douglas of Kirtleside, Chairman of British European Airways, commented wryly that the statistics quoted in the report "do not suggest that he has too much to complain about."

Douglas was making specific reference to the fact that in the year ended June 30, 1958 the independents' passenger-miles totaled 1,117 million, a 26% growth, while for the same period BEA's figure was only 936 million (up 10%). The comparable BOAC figure was 1,450 million passenger-miles, 9% above the total for the previous year.

To understand the comparisons one must bear in mind that the scheduled operations by the British independents represent only about 25% of their offered capacity. The great majority of the independents' traffic and revenue comes from air trooping operations. In fact, about 60% of all the capacity offered in 1957/58 was in this category. Nonetheless, the scheduled operations are responsible for

the bulk of the passengers and freight actually carried but since these operations are mainly short-haul the resultant traffic effort is rather a small proportion of the whole.

The scheduled operations of the independents can be broken down into six main categories. Perhaps the most important is inclusive tours which in 1957 were responsible for about one-third of all passenger-miles performed on scheduled air services.

These services are extremely seasonal, the summer-winter ratio being 30:1. Another problem is that airlines are licensed for each inclusive tour operation on a seasonal basis and thus the licenses have to be submitted for renewal each year.

The second category of the British independents' scheduled operations is ordinary scheduled services. Here, they have been hampered because for many years this type of operation was forbidden to them. When the barrier was finally removed they were only allowed to operate routes not already flown by the two state-owned airline corporations. In other words they were permitted to apply to open services which BEA and BOAC did not want to operate.

So, with only the skim available, the independents had a hard time getting into ordinary scheduled operations. Most of their services in this category link provincial towns in England with points on the European continent. The results of these operations have not been too encouraging to date.

Domestic services comprise the third category of the British independents' scheduled operations. The flights are mainly seasonal services at weekends from provincial cities

BRITISH INDEPENDENTS' FLEET

Air Charter Ltd.

3 DC-4
6 Tudor
9 Bristol 170
1 Britannia

Airways Union Ltd.

1 Gemini
1 Messenger
10 Single-Engine

Airwork Ltd.

4 Hermes
2 Viscount 700
5 Viking

B.K.S. Air Transport Ltd.

3 Elizabethan
4 DC-3

Britavia Ltd.

5 Hermes

Cambrian Airways Ltd.

2 DC-3
3 Heron
1 Rapide

Dan-Air Services Ltd.

4 York
2 Bristol 170
2 DC-3

Derby Aviation Ltd.

3 DC-3
3 Marathon

Eagle Aviation Ltd.

2 Viscount 800
1 Bristol 170
15 Viking
3 DC-6

East Anglian Flying Services Ltd.

2 Bristol 170
2 Viking
5 Dove
2 Rapide

Hunting-Clan Air Transport Ltd.

4 York
3 Viscount 700
7 Viking
3 DC-3
2 Britannia 300
2 DC-6A
3 Viscount 800

Jersey Airlines

1 Bristol 170
7 Heron
1 Rapide

Morton/Olley Air Services Ltd.

1 Heron
7 Dove
3 Rapide

Scottish Airlines Ltd.

2 York
1 DC-3
1 Twin Pioneer

Silver City Airways Ltd.

21 Bristol 170
12 DC-3
2 Heron
1 Rapide

Skyways Ltd.

8 Hermes
12 York
4 DC-3

Starways Ltd.

2 DC-4
3 DC-3

Transair Ltd.

3 Viscount 800
11 DC-3



Eagle Airways' Viscount, used on Bermuda run, is fairly typical of modern equipment used by some U.K. independents.

to the vacation islands of Jersey and the Isle of Man. Domestic services comprise about 20% of the total scheduled traffic of the independents.

Fourth on the list is perhaps the most famous category of scheduled traffic, the so-called "colonial coach services." These operations are carried out over the same routes as those of the two nationalized airline corporations. They are basically third-class service between Britain and certain points in British overseas territories. Since the number of British possessions is shrinking, the opportunities on these operations are becoming fewer.

Low-fare colonial coach

The colonial coach operations originally started on the basis that they were operated with inferior equipment and at lower fares than offered by BOAC and BEA. The services were pioneered by Airwork and Hunting-Clan which operated Vikings from London to points in Africa, stopping overnight at en route cities with the carrier paying for the passengers' hotel accommodations. These services were well liked and heavily patronized from the very start.

The fifth category of scheduled operation is all-cargo services. The independents have done comparatively little in this field, except to develop automobile ferry services, but are currently contemplating a big expansion with the availability of U.S. specialized freight transports.

Some of the independents' all-cargo operations are carried out in association with surface carriers. Silver City Airways, for example, has an operation from London to Lille in Northern France. Special trucks take the freight from London to Silver City's field by the coast. The cargo is flown across the water to a field on the French coast where it is carried to Lille by French trucks.

A similar surface-air combination comprises the sixth category of scheduled operations performed by the British independents. The basic idea is to use aircraft to cover the overwater part of the journey with buses carrying the passengers to and from airports near the coast. Thus, Skyways can provide a service between London and Paris even though it is not licensed to fly between these cities.

On this particular operation passengers travel by special bus from London to Lympne on the southeast extremity of the British coast. A DC-3 then flies them to Beauvais airport and a French bus takes them on to Paris. The fare is competitive with the rail/boat/rail rate and the journey time is of course less.

These then are the main categories of the independents' scheduled operations. The nonscheduled operations comprise air charter flights and air trooping flights. The latter are of increasing importance since the British government has virtually abandoned the troopships to move military personnel and their dependents to overseas points. Air trans-

port has replaced sea transport almost 100% in this important area.

The requirements of the British government for air trooping have played a considerable part in shaping policies of the British independents. For many years the government did not pay too much attention to what sort of aircraft was provided by the independents for operating military contracts. Things have changed and transports that are at least pressurized are required for long-haul flights.

The British government also recommends carriers to provide aircraft with rearward-facing seats for air trooping work. Thus the antiquated Yorks and Vikings are being replaced by Viscounts and Britannias.

The equipment situation of the British independents is improving somewhat slowly. The carriers have been unwilling to invest in new and costly aircraft until they are sure that the British government will permit them to fully utilize the transports' revenue producing ability.

At the moment they are by no means sure that they will be so permitted. Eagle, for example, bought a small fleet of DC-6Cs and then asked permission to operate an austerity type of operation between Britain and British colonial points at fares about 50% below BOAC rates. The independent was turned down.

It is disappointing for the independents to be faced with the situation that, for the first time, they have the money and the dollar-spending authorization to enable them to buy American aircraft which will permit profitable operations at fares substantially below present levels, yet are not allowed to perform such operations.

No shoestrapping operation

There is no lack of money behind the British independents. They are no longer shoestrapping outfits operated with surplus military transports. Today the majority of the British independents have strong financial backing from steamship companies. They have the means to become major competitors in the world air transport scene if they can get the green light from the British government.

The picture shapes up something like this: Silver City Airways, which has established its reputation on the basis of its automobile ferry services, is controlled through British Aviation Services by the P&O Line, the major steamship company linking Britain with Asia and Australia. Skyways is controlled by another important steamship company specializing in the Asian trade.

Hunting-Clan Air Transport is half-owned by the Clan Line and half by the Hunting "empire" which has substantial steamship interests. Finally, Airwork is partly controlled by Furness, Withy and the Blue Star Line, both giants in the British steamship world. The only big independent that has no steamship company behind it is Eagle.



**Braniff hits the high
note in air travel**

A black and white photograph of a man dressed as a medieval knight, wearing a crown and chainmail, holding a sword. In the background, a Braniff airplane is visible.

BRANIFF *International* **AIRWAYS**

*Braniff serves more major cities in
the U.S.A. and South America
than any other airline.*



Low-level attack on a well protected observation balloon . . . the "Balloon Buster", Frank Luke, in a Spad.

Early War Birds- THE SPAD S-XIII

This French fighter of World War I appeared late in the summer of 1917. When powered with a 235 h.p. Hispano-Suiza engine, the Spad S-XIII had a top speed of 138 m.p.h. at sea level and a rate of climb of 1440 feet per minute. Aside from its swiftness, the Spad was noted for its ability to sustain a prolonged dive without shedding its wings. It was flown with great success by skilled French and British pilots—and by Americans like Frank Luke, who shot down fourteen enemy observation balloons and four planes in the space of 17 days.

On September 29, 1918, Frank Luke took off at dusk for his last balloon strafe. Flying at tree-top level, he attacked and destroyed three "sausages"—each time enduring the concentrated ground fire from thirty or so defending machine guns, as well as the harassment of protecting Fokkers. After the third balloon, he turned on the attacking Fokkers, shooting down two of them. Apparently wounded, he landed. He was killed while resisting German infantrymen. Frank Luke was awarded the Congressional Medal of Honor for his exploits.



● A pioneer in the development of aviation fuels, Phillips Petroleum Company is today a leading supplier of high octane gasoline for commercial, private, and military aircraft . . . and of *super-performance* jet fuels for turbo-props and jets. And Phillips research continues to lead the way, developing new fuels for the aircraft of tomorrow.

AVIATION DIVISION • PHILLIPS PETROLEUM COMPANY • BARTLESVILLE, OKLAHOMA

Pan Am, National Protest Tactics of CAB Probers

Unusual tactics of CAB investigators in searching files of Pan American World Airways and National Airlines have drawn stiff protests from the carriers.

At the same time that it was pushing investigation of the Air Transport Association, CAB sent agents on unannounced visits to PAA and NAL offices in Miami, New York and Washington, where they inspected files, even searched wastebaskets, and photographed documents (see Personal View, p. 7).

Search was made in connection with the hearing, then underway, covering jet leases and stock exchange of 400,000 shares between the companies, plus option of PAA to acquire 250,000 additional shares of NAL.

The airlines' lawyers objected strongly to CAB Bureau Counsel's statement that inspection of records was necessary because responses to requests for evidence had not been fully met. No attempt has been made to conceal anything, they stressed.

The search was described by PAA attorney Howard Hamstra as "a serious abuse of the Board's investigatory power." Asserting that "this is something that has got to be stopped," he said PAA had been "subjected to examination by the investigators . . . who came in wholesale and quite contrary to prior practice . . . and wanted to just do a clean sweep of all company files."

NAL attorney Richard Fitzgerald protested attempts to introduce a photostat of a memo from NAL president G. T. Baker to employees stating that the annual profit-sharing bonus could not be paid for the year ended June 30, 1958, and that the company was not in good financial status. The memo was confidential, he said, adding: "If that is going to be the practice . . . airline presidents will have to watch their step when they go out and try to straighten their own people up by issuing memos."

Banker Says Airlines Can Finance More Jets in '60s

Airlines should be able to find money for substantial additional jet purchases by the mid-1960s, according to T. Carl Wadel, vice president of First National City Bank of New York.

With a "few notable exceptions," the \$2.6 billion transition of the domestic trunks to the jet age has been suc-

cessfully financed—"if projected cash generation is realized during the next five years," he said.

From the lender's point of view, it would seem premature now for the airlines to order many additional jets, but "if the initial years of the jet age prove at all financially and operationally successful, there is no reason to assume that lenders would not again be willing to consider at least matching dollar for dollar the airlines' equity—so the potential for borrowing . . . should definitely exist during the 1960s."

Significantly, he added that in that period a potential lender "would probably look with far more sympathy on a relatively high debt-equity ratio should additional equity through public sale be difficult at that time, if the airline has shown willingness to seek additional equity during the intervening years whenever it could do so without too severely diluting the stake of its existing stockholders."

On a break-even basis, airlines "should throw well over \$100 million of cash per year after covering debt maturities so internal cash generation during . . . 1961 through 1965 should provide well over a half billion dollars for additional jet purchases—even leaving out the very real probability that there may be some retained earnings in addition."

Capital Asks Moratorium on Viscount Payments

A moratorium on part of the debt incurred in connection with its purchase of Viscounts is being negotiated with British interests by Capital Airlines.

Notes totaling \$5,074,512 were due but not paid last year, and an additional \$12,234,772 becomes due this year, or a total of \$17,309,284. Capital proposes to pay a minimum of \$5,149,549, plus additional amounts if operations improve, and the moratorium would apply to the rest. The company said it intends to refinance or defer the debt which becomes due at Dec. 31, 1959.

Original investment in Viscounts and spares was \$70.2 million, of which \$27.5 million has been paid.

Monroney Pushes Proposal for New Airfreighter

A conference with airline presidents is the next move by Sen. A. S. Mike Monroney (D-Okla.) in his campaign for a new airfreighter for civil-military use.

Describing the plan as "very much alive," the chairman of the Senate Aviation Subcommittee said he wants to discuss proposals for joint military-civil financing of the freighter and to get an idea of how many the airlines could use.

He favors a fleet of 400 turbine-powered aircraft, each capable of carrying 70,000 lbs. payload nonstop across the ocean. Such an order would enable any of the U.S. manufacturers to produce a reasonably-priced plane with direct operating costs of less than 5¢ a ton-mile, he believes. With airlines flying the planes, carrying first-class mail, for example, there would be an emergency cargo fleet in readiness.

Nine Carriers Get MATS Passenger, Cargo Contracts

Contracts to nine civil carriers to fly overseas passengers and cargo during April, May and June have been awarded by Military Air Transport Service. The awards:

Flying Tiger Line: 147 tons of cargo per month roundtrip between Dover AFB, Del., and Mildenhall AFB, England; 462 tons during the three months roundtrip from McGuire AFB, N.J., to Rhein Main, Germany; 189 tons monthly roundtrip between Dover and the Azores.

Pan American: 34.65 tons of cargo in April from either McGuire or Dover to Rhein Main or Mildenhall.

Alaska Airlines: 1,848 roundtrip passengers monthly between McChord AFB, Wash., and Elmendorf AFB, Alaska; 96.25 tons of cargo in June from Travis AFB, Calif., to Tachikawa AFB, Japan.

Transocean Air Lines: 720 roundtrip passengers monthly Travis-Okinawa; 450 monthly Travis-Manila.

Slick Airways: 92 passengers monthly roundtrip Travis-Okinawa.

Capitol Airways: 140 tons monthly Dover-Madrid.

United States Overseas Airlines: 88 roundtrip passengers monthly Travis-Tachikawa.

Seaboard & Western: 594 tons during the three months McGuire/Dover to Rhein Main/Mildenhall.

Overseas National: 55 tons in three months McGuire-Rhein Main; 82.5 tons monthly roundtrip Dover-Chateauroux AFB, France; 27.5 tons monthly McGuire-Chateauroux; 348 roundtrip passengers monthly McGuire-Rhein Main; 525 tons Travis-Tachikawa.

THE OFFICE OF THE AIR...a new standard in executive flying



The Canadair-Convair '540'
is powered by
Napier-Eland jet-prop engines.



CANADAIR, Montreal, Canada • Canadair

CANADAIR CONVAIR 540

JET-PROP EXECUTIVE VERSION

*Functional for business purposes . . .
Spacious for prestige executive suites*

The Canadair-Convair '540' executive aircraft offers a new major development in business flying: the '540' has *airliner size* that provides roomy work-in-flight office space for as many as 24 people, or ample room for custom-designed executive offices, lounges and staterooms . . . it is *jet-prop quiet* for normal conversation and work . . . it is *fast*, with speeds up to 340 m.p.h., and saves many precious minutes of executive time . . . it is *long-range* and capable of one-stop transcontinental flight.

Company officers and corporation pilots will also appreciate these other

important advantages: demonstrably lower cost of operation and maintenance, ability to get in and out of almost any airport, and basic reliability established during the 6,000,000 hours of flying experience of the Convair series in military, airline, and business use.

Behind the '540' stand the manufacturing reputations of two great aircraft manufacturers, Convair and Canadair, both members of the General Dynamics family of companies.

This new 'office-of-the-air' merits your closest study.

The Executive '540' is being demonstrated in many major American and Canadian cities: watch for its arrival in your area.



Your request for a copy of our brochure will receive immediate attention. Contact R. L. Avey, Commercial Aircraft Sales Department, P.O. Box 6087, Montreal.



Canadair subsidiary of General Dynamics Corporation

Circle No. 20 on Reader Service Card.

CA50-540-24 UST



ABOUT THE AUTHOR

Byron A. Moe, a captain with Allegheny Airlines with more than 10,000 hrs. flight time, started flying in 1940. During three years with the military and five with American Airlines prior to joining Allegheny, he flew both transatlantic and domestic transcontinental operations. Captain Moe was invited by Napier and Canadair as an independent consultant to fly and evaluate the 540 from the viewpoint of an airline pilot. Here AIRLIFT presents his account of the two-hour test flight.

A Pilot Checks Out Canadair's 540

Turboprop model of the Convair passes test with flying colors. Praise is heaped on aircraft's performance, low noise level, reduced vibration and 'that extra power.'

By Capt. BYRON A. MOE

It was 3:11 p. m., March 11, when we taxied the Napier Eland-powered Canadair 540 from the ramp in front of the Canadair factory at the Cartierville Airport in Montreal. Outside air temperature was 30°F, ceiling and visibility unrestricted, surface winds 8 mph, conditions for the test ideal.

All cockpit checks had been completed; V1 and V2 were determined at 100 knots and 109 knots respectively at the operating weight of the aircraft, which was 48,000 lbs.

Engine start was quickly accomplished without the use of any ground power equipment. An all-clear was received from the agent on the ground and, with propellers in ground fine rpm at 8,500, we moved smoothly along the taxiway.

A short distance from the approach end of the takeoff runway, Canadair's engineering pilot, "Scotty" McLean, advised the tower controller we were ready for takeoff. A clearance was immediately received and we moved into takeoff position on the runway.

Since the usual five or six-minute piston engine runup check is eliminated with the use of turbine engine, we commenced our takeoff role at once. At 3:13 p.m. takeoff power was applied smoothly and quickly at 12,500

rpm developing 3,500 eshp. The rate of acceleration was almost startling even to an old hand. The Eland turboprop engine delivers up to 95% of torque within five seconds from power application.

The aircraft was off the ground in less than 20 seconds. We passed through V1 and V2 speeds so rapidly that the old method of calling numbers seemed almost useless. Throughout initial climb jet-pipe temperatures were steady at 580°C.

First power reduction to 12,000 rpm, 2,850 eshp with jet-pipe temperatures of 550°C, was made as soon as the ship had been cleaned up for climb. At 3:14:45 or 1 minute 45 seconds after the application of first power for takeoff we passed through 4,000 ft. ASL at an air speed of 145 knots indicating a rate of climb at this point of 4,300 ft. per minute.

At 3:20 p.m. we climbed through 15,000 ft. still utilizing 12,000 rpm and now at 2,100 eshp, jet-pipe temperature still 550°C, air speed 155 knots. At 3:24 we were in full cruise at 20,000 ft., using 11,750 rpm, 1850 eshp, jet-pipe temperature of 530°C. Outside air temperature was -30°C, true air speed 343 mph.

Time from takeoff to 20,000 feet

and full cruise, exactly 11 minutes. While cruising at 20,000 ft. a variety of other cruise configurations was demonstrated to show the levels of flexibility to which the Eland turbine could be put.

At 11,500 rpm, 1,650 eshp jet-pipe temperature 510°C, fuel flow was 1,050 lbs. per engine, true air speed 325 mph. At 11,000 rpm, 1,175 eshp jet-pipe temperature 490°C, fuel flow 700 lbs. per engine, true air speed 290 mph.

Leading up to the takeoff, test pilot McLean and Ian McTavish gave me what amounted to an accelerated ground training course on the 540. Now, after a short flight familiarization, I proceeded to work the airplane through all of the maneuvers and conditions normally performed as part of a six-months proficiency flight check regularly given each airline captain.

Steep turns of 360° were accomplished at 45-50° angles of bank, rolling from a left turn immediately into a right turn. The aircraft performed with positive and effective control at all times. Speed loss was approximately 20-25 knots, nose-up trim was from 1½° to 2°. Altitude control was no problem.

Working our way down from 20,000 ft., single-engine performance was noted and practiced at 9,000 ft. Cruise configuration, one engine inoperative, utilizing 11,750 rpm, 2,550 eshp, jet-pipe temperature 530°C, true air

speed was 254 mph. Steep turns at 45° to 50° of bank were accomplished on single engine turning into both good engine and bad engine directions. Speed loss was approximately 30 to 35 knots, nose-up trim 4-5°—control excellent.

Maneuvering at an altitude of 5,000 ft., I stalled the 540 in all required configurations with both two- and single-engine power available, in a full stall, gear down, full flaps, with the nose about 6° above the horizon. The first stall indications were noticed in a slight buffeting about a second before full stall. The aircraft broke fast, straight ahead, with no tendency to fall off to left or right.

Less than 300-ft. loss

As the nose dropped through the horizon, power was applied at 12,000 rpm, 2,925 ehp, gear raised and flaps set for takeoff position. An immediate response in airspeed and controllability permitted recovery to level flight with an altitude loss of less than 300 ft.

On a subsequent single-engine stall, the tendency to fall off in the direction of the dead engine was almost negligible. Recovery with the engine still dead was effected in about 40 seconds and with an altitude loss of about 400 ft. Return to altitude took one min. 10 sec., using 12,000 rpm, 2,925 ehp and a 400-fpm rate of climb.

The emergency descent (better known as the dive in the rain barrel) was initiated at 6,000 ft., speed 125 knots, gear down, flaps 15°, idle power 8,500 rpm, jet-pipe temperature 420°C. Recovery was effected at 5,000 ft., pull-out after one minute in a climbing 180° turn at 30° of bank both engines operating now at Meto power—12,000 rpm, 2,625 eshp, jet-pipe temperature 550°C, speed still 125 knots, rate of climb 4,200 ft. per minute. Recovery at 6,000 ft. was effected in approximately 23 seconds.

In the landing aloft we started this

maneuver at 6,000 ft. entering a downwind leg for our hypothetical airport at 5,000 ft. Landing checks were completed, gear down and full flaps on the final approach. At approximately 5,100 ASL, as the aircraft was being slowed to 110 knots, the order to pull up was given and a pull-out procedure executed.

At this point the left engine was shut down. Power in the good engine was advanced to 12,000 rpm, 2,625 eshp, jet-pipe temperature 550°C, speed 120-125 knots. Power delivery was rapid and effective. No difficulty was experienced in establishing a positive rate of climb which continued to increase as gear retracted stabilizing at 350 to 400 ft. per minute, throughout the entire recovery and back to the original altitude of 6,000 ft. ASL.

The immediate availability of Meto thrust on the good engine eliminated any tendency for the aircraft to descend below the specified airport altitude of 5,000 ft. Directional control was good at all times, rudder trim was set at 4° bank into the good engine. Return to the original altitude on one engine was accomplished at a constant speed of 130 knots at Meto power.

A simulated low approach down to 500 ft. was practiced to determine the handling characteristics of the aircraft under conditions approximating maneuvering required throughout all phases of an instrument approach. Utilizing 10,500 rpm, 1,350 eshp, jet-pipe temperatures 465°C, we were able to maintain a comfortable approach speed of 125 knots. It was particularly interesting to note that in this configuration the over-all noise level had diminished to a point where even quiet conversation would suffice in the cockpit.

Approach and landing were made in accordance with airline procedures. After landing, the deceleration resulting from immediate availability of

"ground fine" propeller pitch permitted us to turn off at the first taxiway, moving at conservative taxi speeds, after using less than 2,500 ft. of runway.

The reduced noise level and vibration factor of the Canadair 540 presents a condition of improved convenience and comfort for both passengers and flight crew alike. Shouted and misunderstood conversations between crew members may soon be a part of aviation's past history. Availability of adequate and even extra power, in terms of thrust and lift, can only result in greater safety and improved performance.

Canadair is now turning out two versions of the 540. Version A is the Canadian-manufactured Canadair 540, born with the British Napier Eland 3,500-hp gas turbine engines. Version B is the original Convair 340 or 440, converted to turboprop power by replacing its piston engines with Elands. Enthusiasts are predicting a profitable life span for the three-nation turboprop, as long as that of the DC-3, still in the running today after more than 20 years.

Tailor-made seating

Seating capacity has been increased from 44 to 48 seats on the standard 540, but Canadair has tailor-made "Seating Plans" up to 64 seats which it feels will make the airplane a natural for high-density, short-haul operations.

When compared with piston-engined Convair models, the Canadair Convair 540 has the potential for cutting direct operating costs from approximately 91 to 82¢ per mile.

Company officers also feel that the additional productive capability of the Canadair Convair 540 will more than pay for its cost, while the increased passenger attraction of turboprop power automatically will result in a higher average load factor.

Napier-Powered 540

Weights

Max. takeoff wt.	53,200 lbs.
Max. landing wt.	50,670
Wing loading	57.7 lbs./sq. ft.
Min. power loading	7.80 lbs./eshp

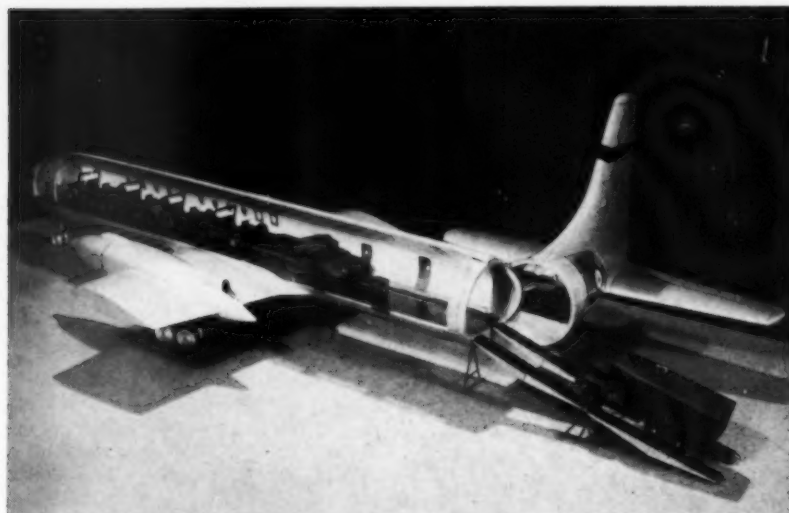
Performance

Avg. cruise speed (20,000 ft., 11,750 rpm, 50,000 lbs.)	273 knots
CAR takeoff runway	4,120 ft.
Length at 53,200 lbs.	
Landing (50,670 lbs.)	3,860 ft.

Dimensions

Fuselage	79 ft. 2 in.
Wingspan	105 ft. 4 in.
Height	28 ft. 1 in.
Wing Area	920 sq. ft.





CL-44G New Swing Tail Turboprop

Canadair, Ltd., Montreal, has disclosed first details of its Model CL-44G, second of the "swing-tail" variety of aircraft competing for the U.S. Air Force's requirement for a long-range cargo transport. Earlier, Convair unveiled a swing-tail and kneel-down version of its 880 jet (AMERICAN AVIATION, Feb. 23, page 18).

The CL-44G, a distant relative of the Bristol Britannia but with a much higher gross weight, will be powered by four Rolls-Royce Tyne 12 turbines, cruise at 400 mph with a maximum fuel (10,150 imperial gallons, U.S.) range of 5,800 miles.

Maximum gross weight is pegged at 205,000 lbs., payload at 65,000 lbs. of cargo or 167 passengers and 10,000 lbs. cargo. Canadair officials say CL-44G's direct operating cost would be the lowest available, 3.5¢ per ton-miles for cargo and less than 1¢ per seat-mile for passengers.

Main cabin is about 100 ft. long and total volume 7,375 cu. ft., including belly compartment space.

Principal cargo features of the Canadair proposal are the swing-tail provision and a lowered aft fuselage cargo floor that would accommodate items measuring 100 in. in width and height.

The swing tail, hydraulically actuated, would be retained by two large external hinges spaced 90 degrees apart. In locked position, nine equally-spaced latches would distribute fuselage tension and shear loads. Each latch would be rated for 50% overload so that adjacent latches would be capable of sharing the load in event of a latch failure.

Canadair has selected a pair of bevel gearboxes on each side of the fuselage "break" to handle control system disconnects when the tail is swung open. A 200-lb. stowable loading ramp is designed for easy dismantling and provides a 13-degree entrance slope for loading vehicles.

Floor loading is designed for 300 lbs./sq. ft. throughout the fuselage with a rating of 750 lbs. where vehicle wheels or tracks rest.

OPERATIONS

Hope for no slope

First experience in the ground handling of Boeing 707s in airline service indicates that sloping airport ramps present one of the biggest nuisance factors that hinders high-speed refueling, according to Boeing engineers F. K. Brunton and J. C. DeWeese.

In a joint SAE paper presented this month, they reported the need to set up corrections for fuel quantity indicators, corrections for underwing "dripsticks." Their observation: Level fueling ramps are highly desirable if airlines want to achieve shortest possible fueling times and best fueling accuracy.

High altitude, low temperature

Lowest air temperature recorded by Pan American during December 707 operations was -68°C (-90°F) although 78% of flights exceeding three hours recorded -50°C or below. Lowest fuel temperature was -38°C which is 12°C (21°F) warmer than the kerosene specification freeze point. (707 has a 140-lb. fuel heater-filter system which the crew operates for one minute every half hour when temperature falls below 0°C).

Jet 'reversal' in flight

Boeing has experimented with in-flight application of thrust reversers on 707 at 20,000 ft. Applying both outboard reversers full, little happened but some buffeting was noticeable. When both inboard reversers alone were actuated again little happened, but some pitch change was noted, Boeing's J. E. Barfoot reports.

Orders and Deliveries

Lockheed Electra flying San Francisco-Honolulu during delivery by Ansett-ANA crew chopped about two hours from current DC-7 schedule for the Pacific leg. Electra's time was 6 hrs. 18 mins.

Boeing rolled out BOAC's first of 15 707-420s to be powered by Rolls-Royce Conway bypass engines. First flight is set for late this month or early May, first delivery late this year. Gross weight: 311,000 lbs.

Irish Air Lines order for three Boeing 720s brings Boeing total to 39 for this model. Others: United's 11, American's 25 (Boeing calls AA's 720s, AA calls them 707s).

NOR Shapes Up 340's

An \$80,000-plus modification project involving some 4,250 shop man-hours is in the works at North Central Airlines to improve its newly acquired Convair 340s.

Addition of a \$12,000 Convair 440 type exhaust muffler kit will cut cabin noise level by 70% and installation of a Collins' VHF communications system will save some 50 lbs. per airplane.

As a third change, North Central will cut down battery servicing needs by adoption of Sonotone nickel-cadmium batteries to replace lead-acid models.

SAFETY

AVCIR Survives

Aviation Crash Injury Research, Phoenix, Ariz., became an affiliate of Flight Safety Foundation on April 1. A. Howard Hasbrook remains director.

TRAINING

New Orders at Link

United, Continental and Trans World Airlines have placed orders with Link Aviation, Inc., Binghamton, N.Y. for its jet engine trainer for instructing maintenance and flight personnel.

Unit costs about \$12 per hour based on eight-hour day utilization compared to \$100/hr. for a jet engine on test stand and more than \$1,500 for a 707 or DC-8 in flight, Link says.

United also ordered a Boeing 720 electronic flight simulator from Link.

Airline Stocks Lure Trust Funds

New popularity with investment funds should strengthen financial outlook

By SELIG ALTSCHUL
Contributing Editor

Airline securities are once more attaining popularity with investment and fiduciary funds.

This is evident in an exclusive survey of the portfolios of some 290 investment funds with total resources of more than \$16 billion. At the 1958 year-end, this group of investment funds, at recent market prices, held an aggregate of \$87 million in the equities of 12 major airlines—all listed on the New York Stock Exchange.

(There were no equity owners showing for Continental, listed on the American Stock Exchange. Northeast, being a special situation with majority ownership held by the Atlas Corp. and with no other fiduciary holders, is excluded from the compilation.)

While these airline equities, in the aggregate, held by these funds represent about one-half of one percent of their total resources, they do reflect an improvement over previous commitments in the air transport industry. In fact, there is reason to believe that airline commitments by investment funds and related fiduciaries are now at their highest point in financial history.

In view of the sharp abyss of investment disfavor in which airline equities had fallen in recent years, this support by trust funds is most encouraging and a healthy development. No doubt, too, the sharp drop previously occurring in airline market quotation placed many equities below book values and made them attractive to discerning funds.

Further, some observers felt that the recent downward adjustments in market valuations may have been overdone in relationship to the prospects prevailing once the transition to jet transportation had been completed.

The airline industry's continued growth and expansion demands create an insatiable appetite for additional capital. As this writer pointed out more than three years ago, the U.S. airlines expansion programs, to be completed, will entail expenditures ranging between \$2.5 and \$3 billion. This compares

with total resources for the same group aggregating, at last count, but \$1.5 billion and total equity of only about \$640 million.

Investment trust funds—and other fiduciary sources—bulk very importantly as a major source of equity capital. These funds, by the sheer size of capital controlled, are obviously an ever-growing factor in the American economy as they can underwrite major expansion programs for industry.

Further, corporations with stock in the hands of the public are most anxious to have their securities held by these investment trusts. It does a number of things—it affords them stable stockholders who maintain long-term positions; it develops an established source for obtaining additional capital, and finally, it builds investment "character" as individual investors are impressed with such trust holdings and frequently are guided to make similar commitments of their own.

The accompanying table reveals the aggregate holdings among 290 investment funds in the individual* airline equities at the 1958 year-end. Shown are the total number of fund holders, total shares held, recent total market valuations and percentages of the total outstanding shares owned for the separate equities.

The largest ownership of a single common stock is in American for a total of \$29,068,000, held by a total of 35 funds. Pan American commands the second largest dollar commitment with an aggregate of \$17.8 million held by 16 funds. United is a close third with about \$16 million held by 19 funds. After the top three in investment fund popularity there is a sharp drop to \$6,550,000 for Eastern and \$5.6 million for Northwest, common.

There were some heavy purchases of American in the fourth quarter last year. Of eight funds having transactions in the common of American, on balance, 120,200 shares were purchased

INVESTMENT TRUST HOLDINGS

	No. of Holders	Total Shares Held	Approx. Mkt. Value* (000)	% of Total Shares Held	No. Shares Outstanding (000)
American—					
Common	35	933,900	\$29,068	11.7%	8,011
Preferred	5	10,900	1,635	7.9	138
Braniff	2	37,000	629	1.3	2,948
Capital	1	3,800	85	.4	910
Delta	8	30,000	1,028	2.7	1,122
Eastern	19	158,300	6,550	5.4	2,929
KLM	6	88,600	3,079	6.2	1,429
National	5	112,300	2,850	9.7	1,159
Northwest—					
Common	6	131,500	5,572	9.7	1,361
Com. Pfd.	4	54,500	2,282	11.9	458
Pan American	16	611,500	17,810	9.3	6,553
TWA	2	15,000	298	.2	6,674
United	19	947,100	15,984	12.2	3,675
Western	3	47,800	151	5.2	924

*As of March 21, 1959

during that period. A total of 96,000 shares represented the initial acquisitions by two funds under a single management. A seasoned observer has viewed this as disquieting, as in the past, the management firm has had the unhappy proclivity of buying airlines at the top and selling them out at the bottom.

Considerable activity took place in the shares of Pan American during the 1958 fourth quarter, all on the selling side, with six funds disposing of a total of 89,600 shares during this period.

The available "floating" supply of the desired airline equities is becoming more limited. This is evident in the accompanying table and may explain the periodic run-ups that sometimes occur when funds decide to accumulate a position in an airline equity.

United, percentage-wise, has the greatest number of shares "lock-up" by investment trusts, 12.2%. American, Northwest, National and Pan American are closely bunched with 10 to 12% of their total equities held by investment trusts.

Actually, KLM has the smallest floating supply of its stock available for public purchase with 77% owned by the Netherlands government. With 6.2% owned by investment trusts, less than 17% is left for the general public.

TWA, of course, with about 80% of its equity owned by the Hughes Tool Co. has the smallest available "floating" supply of any major U.S. trunk airline. The scarcity factor in the supply of stocks can frequently compound the leverage factor in investing in the airline industry once an upward trend in operations is established.

Not to be overlooked is the growing importance of commitments in airlines by other fiduciary funds such as insurance companies and pension funds. As reservoirs of capital, these fiduciary groups exceed the measure of funds controlled by investment trusts by a very wide margin.

In the past, fire and casualty insurance companies have invested in common stocks, including those of airlines. Undoubtedly, they are a factor in holding airline equities today. However, the exact measure of such holdings, as of a recent date, is not currently available.

More importantly, with the surge in popularity which has greeted convertible debentures—which is equity type money—and to a lesser degree, convertible preferreds, more conservative-minded life insurance companies and pension funds are being tempted into this type of securities as issued by the airlines.

The private placement of \$25 million in convertible debentures by Eastern with the Prudential Life Insurance Co.,

is a reflection of this trend. There will be other financing of this type, both public and private, which may prove attractive to fiduciary groups.

For example, KLM, through its brokers, recently sold \$18.5 million in convertible debentures. American Airlines, by a published change in its indenture on existing debt, is pointing to the issuance of a convertible debenture issue soon. There will be others.

This phenomenon of convertible securities financing may go a long way in tapping reservoirs of capital permitting the airlines to obtain sufficient funds to complete their re-equipment and expansion programs. All this, of course, presupposes that basic earning power will be present to support the financing programs undertaken, regardless of their nature.

(Editors' Note—The financing of the airline industry will be analyzed by Mr. Altschul in the next issue.)

FINANCIAL REPORTS

Four more airlines have reported favorable 1958 financial results, while two suffered losses.

American Airlines' earnings totaled \$13,054,000 plus \$3,026,000 from disposal of property, for net of \$16,080,000. The 1957 net was \$10,885,000 including \$1,792,000 from equipment sales. Revenues reached a record \$317.2 million, up 3.7%, and AA estimated the total would have been \$329 million had it not been for the pilots' strike.

Braniff Airways showed net of \$2,973,799, up 77.2% over 1957's \$1,727,100. Operating revenues were up 10.7% to \$69,637,219; expenses rose 8.2% to \$63,260,801.

Capital Airlines reported net profit of \$213,262 against a 1957 loss of \$3,210,355. Revenues were \$95.5 million against \$94 million in 1957 (under a mutual aid strike pact with five other carriers, Capital received net payments of \$2,022,024 during its 37-day mechanics' strike). Expenses were \$92,461,993 against \$94,018,817.

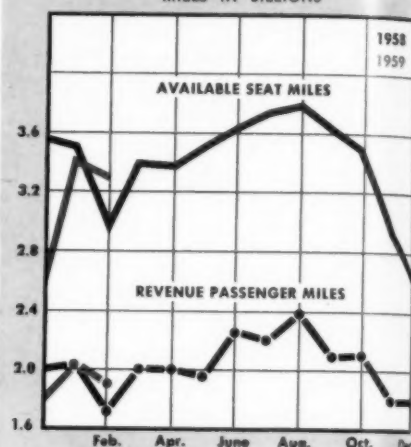
Continental Air Lines' net loss was \$132,555 compared with \$96,073 profit the year before. Operating revenues gained 22% to \$28,455,307, expenses increased 21% to \$24,417,195. Operating income totaled \$1,038,112, but interest expense was \$1,463,742.

North Central's net earnings rose to \$108,184 from \$80,791. Gross revenues were \$13,141,239, up 22%. Company carried 777,140 passengers, 59% more than the second-place local airline.

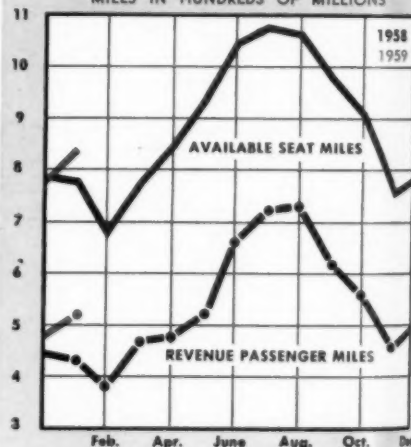
Aloha Airlines' operating loss was \$24,600; net loss \$43,900.

HOW'S TRAFFIC

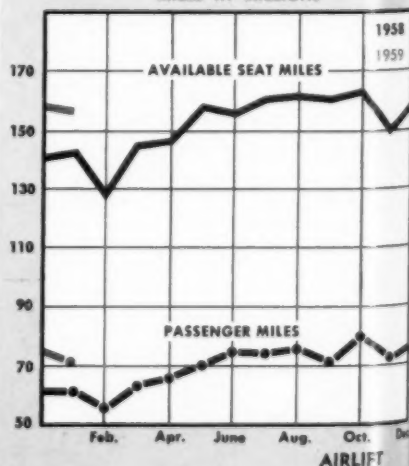
DOMESTIC TRUNKS
MILES IN BILLIONS



INTERNATIONAL
MILES IN HUNDREDS OF MILLIONS



LOCAL SERVICE
MILES IN MILLIONS



AIRLIFT

U.S. Airline Traffic for January 1959 vs. January 1958

This complete summary compiled by AIRLIFT magazine from Official CAB Records.

Airlines	Revenue Passengers			Revenue Passenger Miles			Total Ton-Miles Rev. Traffic			% Available Ton-Miles Used	
	1959 (In Thousands)	1958 (In Thousands)	% Change	1959 (In Thousands)	1958 (In Thousands)	% Change	1959	1958	% Change	1959	1958
DOMESTIC											
American	349	601	-41.9	231,816	402,723	-42.4	28,602,296	47,654,569	-40.0	91.8	54.5
Braniff	193	174	10.9	92,634	76,586	20.9	10,318,719	8,215,795	25.6	56.6	46.3
Capital	323	331	-2.4	141,498	130,100	8.7	14,550,989	13,488,041	7.8	52.1	46.8
Continental	80	69	15.9	46,225	31,771	44.6	4,743,859	3,354,606	41.4	54.4	44.5
Delta	251	230	9.1	135,162	119,785	12.8	14,965,175	13,096,737	14.3	54.3	51.0
Eastern	512	456	12.1	276,260	394,749	-30.0	28,976,062	40,470,323	-28.4	42.1	50.7
National	167	144	15.9	117,375	102,159	14.8	12,499,758	10,880,199	14.8	48.8	48.0
Northeast	95	62	53.2	47,527	34,994	35.8	4,797,454	3,574,596	34.2	46.0	37.8
Northwest	139	111	25.2	110,281	73,091	50.9	12,586,433	8,295,699	51.7	46.5	46.9
Trans World	419	361	16.1	370,460	295,661	25.3	40,238,885	31,702,451	26.9	64.0	53.0
United	564	488	15.6	427,777	352,532	21.3	51,278,801	41,461,218	23.7	60.8	54.5
Western	120	119	0.8	65,952	62,499	5.5	7,008,520	6,534,572	7.3	49.5	47.8
TOTALS	3,212	3,346	-4.0	2,062,967	2,076,850	-0.7	230,566,951	228,748,806	0.8	53.5	51.2
TERRITORIAL											
Caribair	27	21	28.6	1,911	1,504	27.1	208,980	162,879	28.3	69.7	63.2
Hawaiian	32	29	10.3	4,764	4,176	14.1	492,185	446,728	10.2	57.0	52.9
Trans Pacific	13	13	0.0	1,726	1,662	3.9	145,261	139,947	3.8	52.5	51.0
TOTALS	72	63	14.3	8,401	7,342	14.4	846,426	749,554	12.9	58.8	54.4
LOCAL SERVICE											
Allegheny	33	33	0.0	5,746	5,568	3.2	596,571	566,945	5.2	43.6	40.3
Bonanza	16	15	6.7	3,866	3,416	13.2	385,332	340,068	13.3	47.1	42.5
Central	12	10	20.0	2,672	2,107	26.8	270,275	215,101	25.7	34.7	30.6
Frontier	19	18	5.6	5,068	4,851	4.5	565,443	538,871	4.9	52.8	56.9
Lake Central	15	14	7.1	2,513	2,260	11.2	257,487	232,218	10.9	44.2	38.4
Mohawk	42	31	35.5	8,343	5,708	46.2	831,253	577,377	44.0	40.6	48.6
North Central	58	55	5.5	9,902	9,008	9.9	1,009,459	913,324	10.5	47.5	44.1
Ozark	33	32	3.1	6,154	5,195	18.4	632,810	531,392	19.1	50.6	43.8
Pacific	31	31	0.0	6,811	6,318	7.8	672,702	636,380	5.7	46.2	46.2
Piedmont	34	17	100.0	7,470	3,173	135.4	753,081	324,844	131.8	43.4	36.3
Southern	20	26	-23.1	3,565	5,746	-37.9	374,309	566,179	-33.9	37.7	45.2
Trans-Texas	21	20	5.0	5,080	4,457	14.0	541,036	472,659	14.5	43.6	38.3
West Coast	23	19	21.0	4,437	3,495	27.0	436,823	343,397	27.2	44.3	42.9
TOTALS	357	321	11.2	71,627	61,302	16.8	7,326,581	6,258,755	17.1	46.4	43.2
HELICOPTER SERVICE											
Chicago	9	6	50.0	165	109	51.4	16,711	11,972	39.6	30.2	88.0
Los Angeles	2	2	0.0	75	88	-14.8	12,765	13,878	-8.0	52.2	87.4
New York	7	5	40.0	142	92	54.3	16,452	11,540	42.6	42.9	75.5
TOTALS	18	13	38.5	382	289	32.2	45,928	37,390	22.8	38.9	84.2
INTERNATIONAL											
American	5	11	-54.5	6,696	9,371	-28.5	858,022	1,281,483	-33.0	67.6	61.8
Braniff	3	4	-25.0	6,481	7,767	-16.4	827,854	974,883	-15.1	39.6	44.3
Delta	4	6	-33.3	5,192	7,507	-30.8	635,300	877,640	-27.6	48.2	55.8
Eastern, Overseas	27	30	-10.0	39,904	42,142	-5.3	4,314,832	5,442,286	-20.7	57.6	52.1
San Juan	22	25	-12.0	33,286	35,434	-6.2	3,544,496	3,908,390	-9.4	60.1	71.4
Bermuda	1	1	0.0	502	1,212	-58.6	55,187	129,352	-57.3	19.2	30.2
Mexico	4	4	0.0	6,114	5,496	11.3	695,149	627,756	10.7	54.9	48.6
National	7	11	-36.4	5,226	7,636	-31.6	589,863	876,788	-32.7	41.0	45.5
Northwest	11	8	37.5	23,807	19,474	22.3	4,471,497	3,530,601	26.5	60.6	55.5
Hawaiian	3	1	200.0	6,867	4,117	66.8	752,772	453,674	65.9	69.8	60.0
Panagra	10	11	-9.1	13,768	13,687	0.6	1,971,250	1,948,276	1.2	56.0	56.2
Pan American System	211	190	11.1	322,893	263,622	22.5	44,317,365	37,125,878	19.4	62.8	57.3
Latin America	111	102	8.8	126,323	108,164	16.8	16,852,600	14,981,009	12.5	68.1	63.1
Atlantic	74	65	13.8	103,580	81,622	26.9	14,499,972	11,984,040	21.0	56.4	51.5
Pacific	23	20	15.0	90,324	70,538	28.1	12,535,683	9,620,588	30.3	65.9	55.1
PDX/Sea-Hon.	3	3	0.0	6,518	5,251	24.1	715,921	555,820	28.8	59.5	47.2
Alaska	3	3	0.0	2,666	3,358	-20.6	429,110	540,241	-20.6	42.1	51.4
Trans Caribbean	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Trans World	22	16	37.5	70,957	44,588	59.1	10,113,795	6,131,941	64.9	64.4	50.9
United	8	7	14.3	18,450	16,478	12.0	2,083,520	1,849,484	12.7	54.7	52.1
Western	5	2	150.0	8,110	3,289	146.6	890,693	362,354	145.8	72.2	63.8
TOTALS	313	296	5.7	521,484	435,561	19.7	71,073,991	59,524,826	19.4	61.3	56.1
ALASKAN											
Alaska	5	4	25.0	3,072	1,893	62.3	578,618	423,438	36.4	39.8	38.3
Alaska Coastal	3	3	0.0	219	258	-15.7	28,353	33,263	-14.8	46.5	45.0
Cordova	1	1	0.0	138	98	40.8	45,952	20,064	228.6	47.8	39.8
Elmendorf	3	3	0.0	159	179	-11.2	19,338	21,513	-10.1	67.9	67.4
Consolidated	1	1	0.0	431	339	27.1	109,325	94,226	16.0	56.0	57.9
Pacific Northern	7	7	0.0	6,462	5,952	11.9	1,011,350	934,706	8.2	52.2	50.5
Reindeer	1	1	0.0	574	261	119.9	178,908	109,095	64.0	52.8	41.9
Wainwright	2	1	100.0	570	331	72.2	383,497	172,006	122.9	57.0	54.4
TOTALS	23	21	9.5	11,825	9,311	27.0	2,375,341	1,808,313	31.4	49.4	47.2

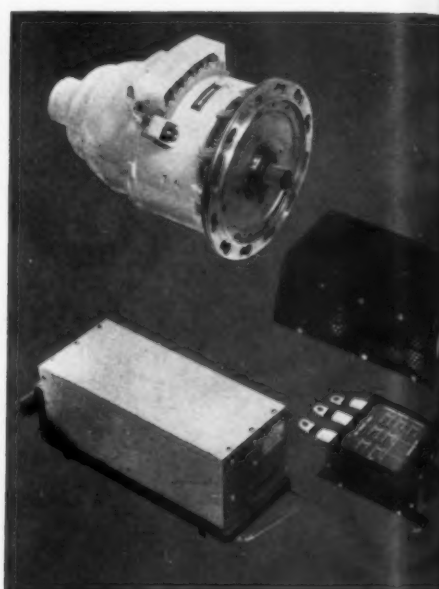
NOTE: Complete 1958 traffic report will be published in AIRLIFT's Annual Air Transport Progress Issue next month.

CAPABILITIES FOR DEFENSE

Westinghouse electrical systems,
using first brushless generator,
proved in thousands of flight hours



NOW IN FULL-SCALE PRODUCTION. The world's first aircraft brushless generators have a key role in advanced electrical systems provided by Westinghouse for today's military and commercial aircraft. The 40 kva units above are standard in Boeing 707 jetliners. First introduced in 1954 by Westinghouse Aircraft Equipment Dept., Lima, Ohio, these dependable generators have performed thousands of flight hours on the Boeing 707 and the Air Force B-58.



LEADER IN AIRCRAFT ELECTRICAL SYSTEMS. Westinghouse has been producing aircraft electrical systems since World War I—has built more aircraft electrical systems for aircraft since World War II than any other company. Shown is the brushless air-cooled generator with control apparatus.



NAVY—The North American A3-J, completing flight tests preparatory to joining the fleet, uses the Westinghouse electrical system, including oil-cooled brushless generators.



AIR FORCE—The Convair B-58 Hustler employs the Westinghouse electric power system, including oil-cooled 40 kva brushless generators.



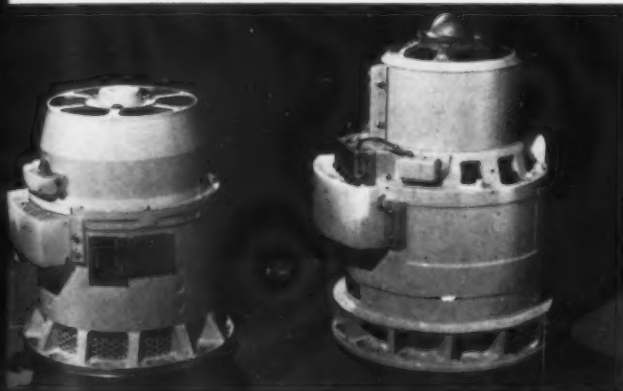
LONGER SERVICE LIFE and greater reliability result from the elimination of commutators, carbon brushes and collector rings, shown at right. A single internal rectifier bundle, held by girl, replaces them. High-temperature silicon diodes, produced by Westinghouse research in semiconductors, make this possible.



OIL-COOLED GENERATOR for Convair B-58 Hustler achieves major breakthrough of temperature barrier in electrical generator design—is cooled by MIL-L-7808 oil, having inlet temperature of 300° F. Usual generator troubles are eliminated—no brushes, commutating or slip-ring parts to wear. Results: greater economy, less frequent overhaul.



AUTOMATIC FUNCTION SIMULATOR, one of the newer testing techniques used by Westinghouse, assures more reliable protective devices for electrical systems. This machine subjects protective control panel to as many situations as it will encounter in flight operations.



BRUSHLESS VERSUS BRUSH-TYPE GENERATOR. Both generators are 40 kva. The brushless generator on the left above uses less space and weighs less. Longer life is assured—air-cooled brushless generators are guaranteed for 3,000 flight hours, bearings up to 1,500 hours. Brushless generators with even greater life are under test at Westinghouse.



ROBOT CIRCUIT TESTER uses punched tape to check circuitry of control equipment with 100% accuracy, 60 times faster than previous techniques. Westinghouse automatic circuit-testing facilities speed production, eliminate chance of human error, improve product reliability.



COMMERCIAL—The Boeing 707 uses Westinghouse electrical system, including air-cooled brushless generators—proved in thousands of flight hours.

Westinghouse

DEFENSE PRODUCTS

1000 CONNECTICUT AVENUE, N. W., WASHINGTON 6, D. C.

AIR ARM DIVISION
AVIATION GAS TURBINE DIVISION
ELECTRONICS DIVISION
AIRCRAFT EQUIPMENT DEPARTMENT
ORDNANCE DEPARTMENT

YOU CAN BE SURE... IF IT'S Westinghouse

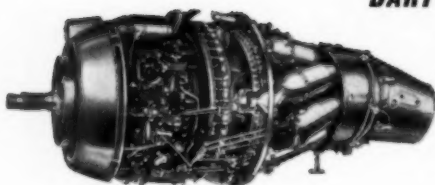
DESIGNED FOR WORLD MARKETS

ROLLS-ROYCE

GAS TURBINES

are in service with or on order for
OVER 60 AIRLINES

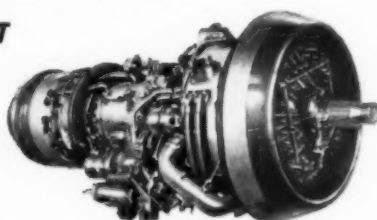
DART PROP-JET



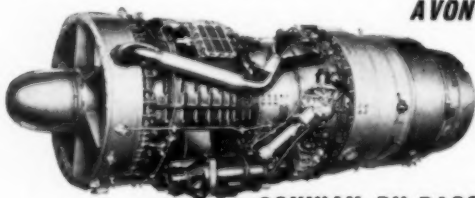
In service or under development at powers ranging from 1,540 e.h.p. to 3,200 h.p. The Dart is the most proven prop-jet in the world and has flown over 7,000,000 hours in scheduled airline service. It has an unexcelled record of reliability and is currently operating at overhaul lives of up to 2,300 hours.

TYNE PROP-JET

The Tyne is an advanced twin spool high compression engine due to enter service in 1960 at ratings of 4,985, 5,525 and 5,730 e.h.p. It has been designed to give low specific fuel consumption and is backed by the unique experience gained by Rolls-Royce in the operation of gas turbine engines in scheduled airline service.



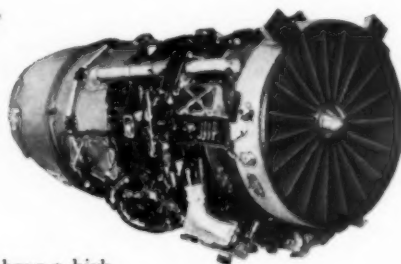
AVON TURBO JET



The Civil Avon has been developed to give low fuel consumption and long life between overhauls. The British Air Registration Board authorised its entry into service at an overhaul life of 1,000 hours.

CONWAY BY-PASS TURBO JET

The Civil Conway has the advantages of low first cost and operating costs, low weight, less noise and low specific fuel consumption. Initial Civil Conways have a guaranteed minimum thrust of 16,500 lb. and engines of 17,500 lb. and 18,500 lb. guaranteed minimum thrust, will be available.



RB. 141 BY-PASS TURBO JET

A new by-pass engine of advanced design, the RB. 141 will have a high by-pass ratio, and a specific fuel consumption and noise level much lower than any existing comparable engine.

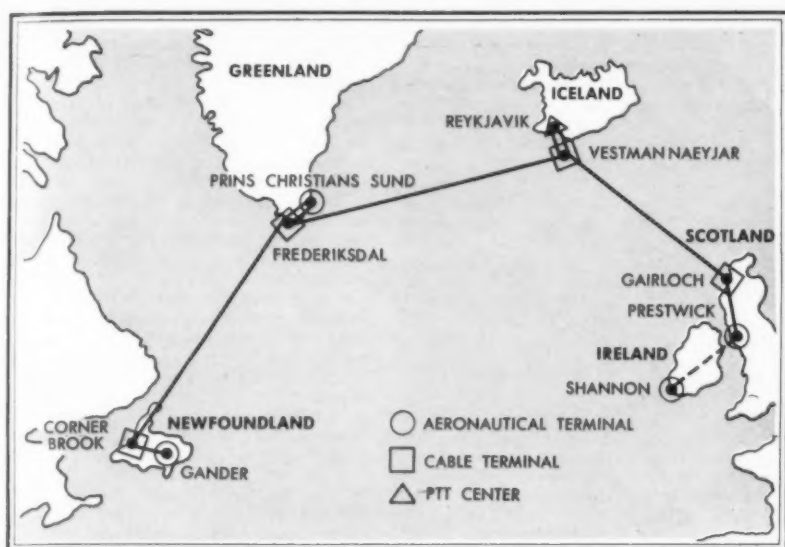
Aer Lingus · Aerolíneas Argentinas · Aerovías Ecuatorianas C.A. · Air Algerie · Air France · Air India International · Airwork · Alitalia · Aloha Airlines · Ansett A.N.A. · Austrian Airlines · Avensa · Aviaco (Spain) · Bonanza Air Lines Inc. · Braathens S.A.F.E. · British European Airways · British Overseas Airways Corporation · British West Indian Airways · Butler Air Transport · Capital Airlines · Central African Airways · Compania Cubana de Aviacion · Continental Air Lines · Eagle Aviation · East African Airways Corporation · Finnair · Hong Kong Airlines · Hunting-Clan Air Transport · Icelandair · Indian Airlines Corporation · Iraqi Airways · K.L.M. Royal Dutch Airlines · La Nica · Linea Aeropostal Venezolana · Lufthansa · Middle East Airlines · Misrair · New Zealand National Airways Corporation · Northeast Airlines · Northern Consolidated Air Lines Inc. · Ozark Air Lines Inc. · Pacific Air Lines Inc. · Pakistan International Air Lines · Persair (Iranian Government) · Philippine Air Lines · Piedmont Aviation Inc. · P.L.U.N.A. (Uruguay) · Quebecair Inc. · Royal Air Maroc · Scandinavian Airlines System · South African Airways · Sudan Airways · Taca (San Salvador) · Transair · Trans-Australia Airlines · Trans-Canada Air Lines · Trans Mar de Cortes S.A. (Mexico) · Turk Hava Yollari · Union of Burma Airways · VARIG VASP (Brazil) · West Coast Airlines Inc. · Wien Alaska Airlines Inc.

WORLD CONGRESS OF FLIGHT

LAS VEGAS · APRIL 12-19

ROLLS-ROYCE LIMITED, DERBY, ENGLAND

AERO ENGINES · MOTOR CARS · DIESEL AND GASOLINE ENGINES · ROCKET MOTORS · NUCLEAR PROPULSION



\$20-million Cable: Boon to Atlantic ATC

Airline pilots flying the North Atlantic can look forward to a big boost in ATC communications efficiency over the next two years, one that promises to erase the harassing problems with HF communications in this area.

The reason: Fourteen nations have put their stamp of approval on a \$20-million submarine cable installation that will serve exclusively for aeronautical communications between ATC centers controlling North Atlantic traffic.

First leg of the cable, extending from the United Kingdom to Iceland, will be ready late in 1960. The remaining link, from Iceland to Greenland to Newfoundland, will be commissioned the following year.

The new cable, installation of which is now being negotiated with a trio of cable firms, will eliminate once and for all the HF radio signal blackouts that have plagued operations in the North Atlantic.

It will also eliminate the present delays extending from 15 to 20 minutes to hours, now experienced by transatlantic pilots in obtaining revised ATC clearances, altitude changes, etc. while en route.

U.S. communications officials hail the 14-nation agreement on the cable as a "fantastic" example of international cooperation in the interest of air safety. They also point out that it represents the first specific program of its kind to be jointly financed through

the processes of the International Civil Aviation Organization.

Initially, the plan was to install "forward scatter" communications facilities to improve the North Atlantic situation. But this plan was discarded when the bids to do the job ran higher than the joint financing ceiling and the performance fell below that specified by the ICAO group.

With the switch to cable, the cost will approximate that of a "forward scatter" system but the reliability will be far superior to anything possible with scatter techniques.

Agreement to proceed with the cable was reached at a meeting in Paris January 12-21, 1959. In the short span of two months since that session all 14 nations have consented to the joint financing plan, making its support unanimous.

Under the plan adopted at that meeting, four nations—Canada, Iceland, Denmark (Greenland) and the United Kingdom—will implement the cable installation and operation. The remaining participants are the U.S., France, Italy, Germany, Norway, Netherlands, Sweden, Belgium, Switzerland and Israel.

Each country will be assessed on the basis of the number of civil aircraft used in North Atlantic service and under this arrangement the U.S. share comes to 44.9%. With estimated annual costs subject to joint financing at \$982,517, the U.S. State Department will pay some \$440,000.

Other shares will be borne by countries as follows:

Netherlands	—9.92%
United Kingdom	—9.65%
France	—6.31%
Canada	—6.20%
Belgium	—3.63%
Sweden	—3.62%
Switzerland	—2.96%
Germany	—2.96%
Iceland	—2.61%
Denmark	—2.42%
Norway	—2.42%
Italy	—1.49%
Israel	—0.82%

Annual cost of the joint financing to the 14 countries was pared by some \$394,327 by the generous offer of Canada to foot a \$258,255 bill for one half of the Newfoundland to Greenland link and of the United Kingdom to pay half of the Iceland to UK link (\$136,072).

Plan for the cable calls for a routing from Corner Brook, Newfoundland to the south coast of Greenland at Frederiksdal, to Vestmannaeyjar, Iceland, then to Gairloch, Scotland. Connecting land-line links will be provided between Gander and Corner Brook in Newfoundland and from Gairloch to Prestwick and Shannon (see map).

In operation, it will mean virtually instantaneous communications for pilots with any of the ATC centers on the North Atlantic run. Instead of competing with the elements to communicate with Gander or Prestwick-Shannon, contact will be made with Reykjavik or Prins Christians Sund and ATC personnel at these points will have available instantaneous communication with these other centers.

A Battle of Statistics: Decca vs. VOR/DMET

The U.S. may have won the battle of short-range nav aids at the recent Montreal meeting of ICAO, but the United Kingdom produced some eye-opening statistics on the relative requirements for Decca versus VOR/DMET for U.S. coverage.

Only 40 Deccas (possibly fewer) would be needed to do the job of more than 1,000 Vortacs.

These figures were used by the U.K. to refute testimony by U.S. representative Bert Denicke that some 128 Deccas would be needed for nationwide coverage.

Applying the same requirements that would call for 128 Deccas, the U.K. replied, it would take 3,600 to 4,000 VOR/DMETs.

WHY TAKE CHANCES?



**GET GREATER PROTECTION
FOR YOUR AIRBORNE OXYGEN
BREATHING EQUIPMENT WITH A
PURITAN HIGH PRESSURE
FILTER UNIT**

Protect regulators and other sensitive parts of your aircraft oxygen system against costly damage due to pressure surge. Puritan's High Pressure Filter Unit gives you these important advantages:

- Precision metal-to-metal seal avoids leaks.
 - No special tools needed to install or replace filter.
 - Sintered bronze filter, pore size .0017.
 - Easy to install on upstream side of regulator or manifold.
 - Rugged construction—corrosion resistant—light weight.
- Quality materials plus fine craftsmanship—that's Puritan.

When ordering, specify No. 118001 High Pressure Filter Unit.
Price \$4.50 each F.O.B. Kansas City.

Aviation Division

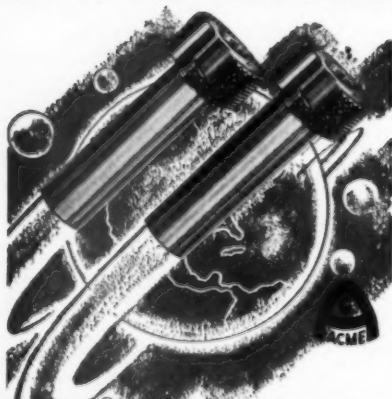
Puritan
SINCE 1919

COMPRESSED GAS CORPORATION
2010 GRAND AVE. KANSAS CITY 8, MO.

Circle No. 24 on Reader Service Card.

with

ACME



**BUSHINGS YOU GET QUALITY...
PRECISION...AND FAST DELIVERY!**

Send me your FREE drill bushing SELECTOR.

Name _____

Firm Name _____

Address _____

City _____

State _____

ACME INDUSTRIAL CO.

213 North Laffin St. • Chicago 7, Ill.

Circle No. 25 on Reader Service Card.

COCKPIT

By CAPT. J. D. SMITH

Two billion for new equipment—Over 400 additional aircraft—Considerably more than \$100 million for improving airport facilities—Untold millions for overall training to implement these commercial aircraft. This in a nutshell represents some of the facets of the airlines' transition to turbine aircraft. To some, a spectacular program—to others, merely another normal expansion of this dynamic industry.

A similar transition, while of lesser magnitude, followed World War II. At that time, practically every major airline was re-equipping its fleet. This changeover was not without many difficulties.

Kinks Ironed Out

We experienced serious airframe problems—aircraft fire hazards—propeller malfunctions—faulty fuel systems—static system deficiencies—adverse effects of CO₂ released in a sealed area—many of which proved fatal.

During the last 10 years, many newer aircraft were put into airline service as a matter of routine. Problems with these were relatively few. Outstanding have been those related to the compound engine. Even in this case, the problem concerns primarily economics, rather than overall safety; a fairly clear indication that appropriate corrective action had been taken.

No one can deny these solutions were curative in nature rather than preventive. Furthermore, the preventive philosophy shown by many airlines has been the primary source for maintaining public confidence and continuing to further improve overall safety of operations. In short, a fail-safe program has paid off.

Horizon Is Clouded

Unfortunately, the future horizon is becoming clouded with an atmosphere similar to the early post-World War II period. The potential problem is the same, namely, lack of in-service evaluation prior to utilization. Then, too, there is the failure to accept constructive suggestions for improvement which are prompted by actual experience.

Instruments which may be easily misread obviously have no place in our aircraft. Yet they were installed. As expected, the interpretation problem presented itself at an early date. In addition, actual malfunctions having serious effect on the safety of operations occurred at an early date.

It is discouraging to realize that a pilot's flight instrument panel becomes inoperative because a single relay fails.

It is frustrating to learn that a tear-

down inspection of a malfunctioning component shows an assembly of improper parts.

It is frightening to know it is possible to make an ILS approach having the instrument providing localizer information from one airport and glide-path data from another.

Equally frightening is the realization that it is possible to have erroneous heading information while not alerting the crew to the fact a malfunction exists.

It is amusing to note that one type airborne computer became unusable when an aircraft exceeded approximately a five-degree angle of bank.

Imagine, at this late date, a design philosophy which provides a captain an alternate source of information through the process of deactivating similar data on the copilot's side.

Then, too, there is the design philosophy which renders both direction indicators useless by a single failure, even though simple, inexpensive ingenuity, if applied, would require a double failure to cause such a condition.

Sounds fantastic, but nevertheless limited in-service operations have already shown all of these conditions can occur.

Basic Needs Missing

These deficiencies exist primarily because of the absence of adequate basic requirements which must be satisfied. True, flight panel equipment meets current FAA Technical Standard Orders. But this is meaningless. TSO's are primarily the establishment of minimum standards.

Nothing exists that specifies the basic manner to obtain maximum fail-safe protection of an electrical wiring system. Obviously, loss of a flight panel through a single malfunction is far from satisfactory.

These adverse conditions are further antagonized by the fact that our new aircraft contain many new type instruments—many of which meet the minimum TSO standard but are not required to be FAA certificated.

Years ago, the then CAA certificated flight instruments. Close monitoring of actual experience by all concerned insured proper reliability and continued adequate quality control. It is interesting to note that current problems concern those areas in which FAA does not certificate.

It is difficult to see how progress will pay off if we have sound airframes, reliable engines, and inadequate cockpit equipment.

Introducing: Capt. J. D. Smith

With this, the first issue of *AIRLIFT*, we introduce a new feature for pilots and industry personnel interested in pilot problems. J. D. Smith, a Capital Airlines' captain with more than 15,000 hrs. flying experience takes over an assignment vacated by Sam Saint. J. D. Smith is a recognized leader in areas of pilot safety and air traffic control. He is a regional safety chairman of ALPA, chairman of the ALPA air traffic control committee, a member of the runway visual range committee and has numerous other safety responsibilities.



Youngstown Airways Profits by Leasing

By BILL COMBS

Today, with scores of flying services floundering on the rocks of bankers' hearts, it is refreshing to find an organization with a solid formula for keeping its business in the black.

Such an organization is Youngstown Airways, Inc. of Youngstown, Ohio, which with its sister corporation, Beckett Aviation of Allegheny County Airport, Pittsburgh, ranks as one of the nation's top aircraft distributors, and is probably the world's outstanding proponent of "lease-maintenance" operations.

Under the guidance of owner Forest S. Beckett, Youngstown Airways and Beckett Aviation lease a fleet of nearly 40 aircraft to 29 corporations throughout Ohio and Pennsylvania. These airplanes include a DC-3, a Lodestar, nine Beech Super 18s, 18 Twin Bonanzas, two Travel Airs, and five single-engine Bonanzas. In addition, Beckett employs 40 pilots, and has one of the top maintenance shops in the Midwest.

Beckett's lease plan enables companies which do not choose to buy their own aircraft to have the advantages of an executive airplane without taking on the problems of its operation.

When a company joins Beckett, it signs two contracts: one with a Beckett-owned leasing company called



Beckett's Twin Bonanzas, all in identical trim, stand ready for business.

Lease-Air, Inc., and one with either Youngstown Airways or Beckett Aviation, which acts as the operating company.

Under the agreement, which extends over a one-year period, the customer makes an interest-free deposit of one-third the airplane's list price, and follows with a set monthly payment plus fuel, oil, maintenance, crew, hangar, communications and insurance costs. Because the airplane is depreciated over a three-year period, the monthly payments amount to 1/36th the list value.

At the end of the 12 months, the customer may buy the airplane by paying one-third the purchase price, or may renew his lease. If the lease is renewed, the deposit is allowed to ride, and the payments are reduced by an amount proportionate to the current value. These reduced payments are scaled so that the customer never pays off the full value of the airplane.

Pilots' fees are another good ex-

ample of how the lease plan is advantageous to the user. On a twin Beech, paying the \$750 per month plus \$20 per hour for two pilots is much cheaper for the customer who flies 40 or 50 hours per month than paying set salaries whether the airplane is flown or not.

When Beckett contacts a potential customer, it first makes a thorough investigation of the firm's transportation expenses to see if an airplane is really justifiable. If this need is apparent, Beckett offers to take officials of the company on a business trip anywhere in the country to demonstrate the airplane's advantages. This trip is made at only pure cost to the customer. If the company is pleased with Beckett's service, sales manager W. H. Hamill will draw up the contract and consummate the deal. Should the customer question the value of the service, more trips may be made until a decision can be reached.

As further inducement, Beckett usually offers a completely renovated used airplane to new customers, thus giving an added advantage of lower deposit and monthly payments.

Beckett's customers include such firms as Westinghouse Air Brake, Packard Electric Division of General Motors, H. J. Heinz Co., Jones and Laughlin's Steel Strip Division, and The Babcock & Wilcox Co. of Beaver Falls, Pa.

Heart of the Beckett operation is its pilot staff, managed by Chief Pilot John D. Carrol.

When a pilot applies for a job, he is screened by a staff psychologist and given a battery of written examina-

—Monthly Fixed and Hourly Charges on Leased Aircraft—

	Bonanza	Travel Air	Twin Bonanza	Twin Beech
FIXED				
Pilot retainer fee	\$250	\$450	\$450	\$750 (2 pilots)
Hull insurance fee	5%	2%	2%	2%
Hangar storage fee ..	\$50	\$80	\$100	\$150
Dispatch service	\$100	\$100	\$100	\$100
(Jeppesen Manuals and Nav maps)				
HOURLY				
Pilot rate per hour ... |	\$10	\$10	\$10	\$20 (2 pilots)
Gas, oil, and maintenance . . . at standard rates				
Liability and property insurance . . . at customer's discretion				



Grounded Airplanes do not make money. Youngstown's shops keep them flying.

tions. If he clears these hurdles, the aspirant then meets a five-man selection board headed by Beckett himself. Once accepted, a new pilot must spend six months to a year as copilot. At the end of this time, he flies 50 to 200 hours in the left seat under check-pilot supervision before finally being allowed to serve on VFR flights as crew captain.

Beckett requires its new "hires" to have 500 to 800 hours and an instrument rating. After receiving a multi-engine rating, each pilot is expected to get his ATR within six months.

A Link trainer is kept on hand by Beckett for constant instrument training, and more than \$100,000 is spent each year on flight checks. Proficiency of Beckett pilots is borne out by the fact that last year they made a total of 3,176 flights, completing 98.9% of all flights scheduled.

Beckett has its own Unicom and VHF frequencies, which its pilots monitor at all times. In addition, the company has an FAA dropline, connected to Cleveland Center, which keeps the company in touch with any control center in the country.

Availability of Beckett aircraft is the responsibility of maintenance chief Roy Palmer who supervises 12 A&P mechanics and four radio technicians in the Youngstown shop. Mechanics work three shifts, 365 days per year, and each four weeks rotate between airframe and engine maintenance.

All maintenance work is on a progressive basis, with 100-hour inspections broken down into four 25-hour sections. Beckett overhauls its own opposed engines and farms out its radials to Airwork Corp. in Millville, N.J.

When Beckett buys a new airplane, it is flown to the radio shop with only a portable transceiver aboard. The shop then installs all navigation equipment, including ADF, dual omni and ILS. Two of the company's Super 18s have Bendix radar and it will be added to the others by the end of the year.

Insurance on Beckett airplanes is bought through Associated Aviation Underwriters. Because of its high standards, Beckett is able to get greatly preferred rates. The company carries a single-limit policy of \$1 to \$8 million, \$25,000 to \$50,000 per seat admitted liability, and \$2,500 to \$5,000 in medical payments. Costs of insurance average about \$2.80 per hour for a Twin Bonanza, and about \$3.25 on a Super 18.

Beckett took over Youngstown Airways in 1944, with only a small maintenance shop and an airline gasoline concession. With three airplanes, the new company went into the charter and flying school business, and by the end of 1946 had graduated 700 GI students.

In 1948, Beckett became the local Beech distributor. Trying to sell airplanes to corporations in the area gave Beckett the idea of leasing. Many companies were afraid to buy or were forbidden to do so by parent companies. So, reasoning that these firms would be more likely to assume operating costs if they did not have to pay the full purchase price, the lease plan was hatched.

The idea caught on, and in 1955 the Pittsburgh Division was opened, with many customers added in that area. Aircraft sales today at Beckett amount to \$1-to-\$1.5 million per year. In 1957, Youngstown Airways was named top U.S. distributor of multi-engine Beechcrafts.

"Our biggest sales problem now is convincing financiers that an airplane has some tangible value," says Beckett. "We can nearly always sell a company if it has a real need for an airplane."

Beckett is planning to expand its Youngstown office in the near future. Encouraged by the good results of its DC-3 Lodestar operations, the company hopes to buy one or more Convair 240s when the price goes down a little more.

Gulfstream Gets Provisional Certificate

Grumman Aircraft's twin-turboprop Gulfstream executive transport was awarded its provisional FAA certificate seven months after its first flight.

The approval legalizes Grumman operations in pilot training and service maintenance programs and to operate it in "environments" for which it was designed.

Canadian Firm Orders 12 Bell Utility Helicopters

One of North America's biggest commercial rotary wing operators will be Autair Helicopter Services Ltd., Montreal, which has ordered 12 Bell 47G-2 Troopers.

It was the largest commercial domestic order ever received by Bell Helicopter Corp.

Autair already has eight Bells in operation, and its fleet will total 20 when deliveries are completed next month.

The Canadian company, headed by D. W. Connor, engages in powerline patrol, hydraulic resources surveys, railroad line construction surveys, mining operation personnel support, and flies tourists over the Montreal area. It was founded in June, 1957, and Connor said enough business is already lined up to keep the entire fleet busy.

Bell's 47G-2 is a three-place ship which flies more than 100 mph, can operate above 18,000 ft., has useful load of 886 lbs., and range of up to 253 miles.

Tip Tanks Add Range To Beech Bonanzas

Safe Flight Extenders, Inc., Stamford, Conn., working with Doman Helicopters, has been granted certification for its Beech Bonanza tip tank design.

The new tanks are said to extend the range of the Bonanza by 450 to 500 mi. Each tank holds 13 gal. of fuel and is constructed of aluminum alloy. Doman says flight tests have shown the tanks to eliminate 35% of Bonanza tail yaw. Yaw damping has been attained by internal baffling and use of a high oval cross-section which gives an end plate effect.

Tanks weigh 7¾ lbs. each, and sell for \$675 per set. Installation may be performed either at the Doman plant in Danbury, Conn., or at appointed dealers throughout the country.

Wisconsin Bank Buys First 'Copter

The 1st Wisconsin National Bank of Milwaukee has taken delivery of a Bell 47J Ranger. The helicopter will be used to transport personnel, haul cash between branch offices, inspect real estate, and visit big commercial customers. One special mission will be flying executives from Milwaukee to Chicago, making a sharp cut on the 2½ hrs. driving time.

Lockheed to Speed JetStar Testing

Lockheed-Marietta will convert one of its two JetStar prototypes from a twin to four-engine (P&W JT-12s) version in December to accelerate flight testing. Production JT-12s will become available in October 1960.

How Butler Grosses \$2 Million



Secret of success, says Dick Fell, is getting well-trained, qualified workers; satisfying customers.

By ERIC BRAMLEY

A fixed base operation at a major terminal takes a lot of chips these days.

It's a department store operation. It's a service station. It's a big repair shop. It takes a big parts inventory. It takes a lot of skilled people and a lot of ground equipment.

Take Butler Aviation at Washington National Airport. Here's a \$500,000 investment better equipped for diversity than any airline base in the country.

And because of its franchise it has to be ready to serve every type of airplane that flies today—except combat military—and does.

A guesstimate puts the number of types at 28 or 29, and this big fixed base operation will handle a total of some 14,000 planes a year—35 to 45 a day.

Even though it grosses about \$2 million a year, Butler-Washington isn't the largest fixed base division of the Butler Co. LaGuardia Field, New York, is bigger. And Butler, which also has operations at Chicago-Midway, Chicago-Meigs, Milwaukee and Rockford, Ill., plans eventually to establish a fixed base chain coast-to-coast and border-to-border.

Even when you have a big operation at an airport such as Washington, you don't just sit on your hands and watch the money roll in. Butler-Washington is managed by Richard E. Fell, a 32-year aviation veteran—well qualified to know that this isn't the easiest business in the world in which to make money.

Fell, who lives aviation—he once left the industry for a year and a half and couldn't stand it—lists some of the problems:

- No advance notice of plane arrivals, in most cases. A large number of executive aircraft may descend on

Washington for an important meeting. They all expect prompt handling.

- Insufficient aircraft parking space—and not only at Washington. As airline operations have expanded, the fixed base operator has been squeezed. "If all the Convairs we handle came in at one time, there wouldn't be room to park them," says Fell. "Sometimes, parking is so congested we'll ask a pilot to unload his passengers and go elsewhere—Baltimore, Richmond, etc." He's hopeful that more space will be made available at Washington.

- Workload in the shops can't be planned. "You'll schedule a double engine change for a Tuesday, turn down other jobs for that day, only to have the customer call on Monday night and cancel because he's got unexpected business elsewhere, or the weather is bad. It's hard to keep the pipeline full."

- The contract with the airport is too short. Butler has a \$500,000 investment at Washington. A new contract must be negotiated every five years (Butler has been on the field since 1949). "This is unstable—the period isn't long enough. Most companies don't want to gamble half a million dollars for five years, when they may be outbid."

- Qualified personnel aren't plentiful. The type of mechanic needed for a fixed base operation is highly skilled and experienced. He must have been in the business a long time, be able to work on all types of aircraft. "He's hard to find; you only accumulate them over the years."

- "Everyone wants everything done yesterday—and to perfection. Everyone naturally thinks his plane is the most important in the world. We try to convince our customers that things

have to be done in an orderly manner to be safe."

Fell tops off the listing of problems by stating: "The secret of a successful fixed base operation is to get well-trained, qualified people, and then dedicate yourself to serving your customers. Every customer is indispensable to us. We give the same quality service to a Cub as to a Convair."

The "filling station" segment of Butler's operation is its biggest revenue producer. For competitive reasons, Fell doesn't list the revenues, but some 3.5 million gallons of gasoline were sold last year (Butler, a Shell dealer, will also secure fuel for turboprops and jets).

In second and third place, revenue-wise, are plane and engine parts, and labor. These are slated to grow substantially.

The filling station operation features service. An incoming private aircraft is met by a station wagon, guided to a parking place, passengers transported anywhere on the airport, order taken for servicing. The plane is gassed, serviced, cleaned and ready to go at the appointed time, passengers and pilots again utilizing the station wagon.

Executive aircraft (a large volume of VIP traffic is handled) follow a different procedure. They taxi to a gate, a Butler representative opens the door, unloads the bags, takes passengers to a taxi (hotel reservations and other services are also furnished). The plane is then directed to a parking area. Butler will order meals (from the Hot Shoppe, which has the Washington concession), pick them up, put them aboard and take care of the billing—all at no markup in cost.

"We ground-handle every non-airline plane at Washington National—private,



Attention to detail is basic with Butler. Thirty-two year veteran of aviation, Fell checks prop installation on Beech Bonanza at Butler-Washington's smooth-running fixed base.

executive, nonskeds, military (including gas and oil for the President's plane), and other government," says Fell. "We handle airline diversions—for example, Pan American, BOAC and others from Idlewild. On diversions, we unload, clean, do emergency maintenance, handle catering arrangements, etc."

Butler, a 24-hours-a-day, 365-days-a-year operation, is the airport's agent for collection of landing fees, and retains 10% for its service. A 25,000-lb. commercial plane (it's commercial if the pilot receives remuneration; private planes pay no fee) is charged \$3.50.

Parking charges range from \$2 for the under 5,000-lb. plane to \$11.50 for 100,001 lbs. and over, for each 24 hrs. or fraction thereof. Hangar parking is from \$4 to \$45. Labor charges vary from \$3.50 per man per hour for unskilled, to \$9 for radar work.

Does complete overhaul

In the maintenance and overhaul end of the business, Butler does everything to an airplane that can be done, from putting in one rivet to a complete overhaul. It does not overhaul engines, but will arrange to have work done by Airwork, Dallas Airmotive, etc. "We have felt this is a very specialized activity," Fell explains. Two of Butler's biggest jobs: an interior for an Air National Guard Convair, an overhaul of a Reynolds Metals DC-3—double engine change, modifications, gear overhaul, etc.—an 8,000-hr. check.

And the emphasis is now on electronics, with the company actively promoting its "one-stop electronics center"—it's licensed to install and service any kind of airborne electronic navigation or communications equipment, including radar.

Inventory of airplane and engine parts runs \$150,000. Carried in stock are parts that experience has shown are most used, principally for DC-3s, Convairs, Lodestars, twin Beeches and sin-

gle-engine Bonanzas. In most cases, other parts can be obtained via overnight air shipment, and there has never been a part that Butler was unable to get. The electronics parts inventory totals another \$75,000.

There are only five twin-engine and 15 single-engine aircraft based at Washington. How, then, do you get maintenance work at what is essentially a transient station? "We get it because a pilot or an executive is impressed by our services and because our prices are competitive," Fell answers. "We try to sell maintenance to everyone."

Maintenance packages

Butler now hopes to lick the problem of being unable to schedule work into its shops by selling "maintenance packages." Customers would come in on regular schedules; the charge would be so much per flying hour. This plan is counted on to keep the pipeline full.

The DC-3, incidentally, gives the least maintenance trouble of any aircraft handled. It's impossible to pinpoint which types are most troublesome, Fell says, pointing out that any plane, new or converted, will need maintenance if it's used a lot.

Doing business at Washington National costs Butler about \$80,000 a year. This includes the lease on an entire hangar (73,000 sq. ft. of floor, plus 15,000 sq. ft. for shops and offices), an operations office in the MATS terminal, some \$15,000 worth of utilities, and a percentage of gross paid to the airport. The latter runs 1% on the first \$400,000, an additional 1% over that figure.

Some idea of the equipment needed can be seen from the fact that Butler has three station wagons, 10 fueling trucks, two oil trucks, one panel truck, three tractors, one jeep—in addition to forklifts, auxiliary power units, etc.

There are 68 employees, and the turnover is low. The reasons: each employee

gets a \$2,000 life insurance policy, unlimited group hospitalization (limited for family members), paid vacations. Butler will lend them money, has carried sick employees at full pay for as long as four months.

The Butler Co., parent organization, has been a paper jobber for over 100 years. A family-owned company, it is headed by Paul Butler, aviation enthusiast, who in 1951-52 served as Defense Air Transportation Administrator. After World War II, Butler got tired of being unable to get adequate service for his twin-engined plane, decided that other executives must be in the same boat. He bought a hangar at Chicago's Midway Airport and went into business.

In 1949, Washington National, which had been trying to handle transients on its own, called in Butler for a conference. A contract was worked out quickly, and Butler-Washington came into existence almost overnight. Next was LaGuardia, now the biggest dollarwise, then Rockford, Milwaukee (the existing fixed base operator was bought out), and Meigs Field, Chicago (the busiest, movementwise; a gas service station only). Butler is the Beech distributor at Midway and Milwaukee.

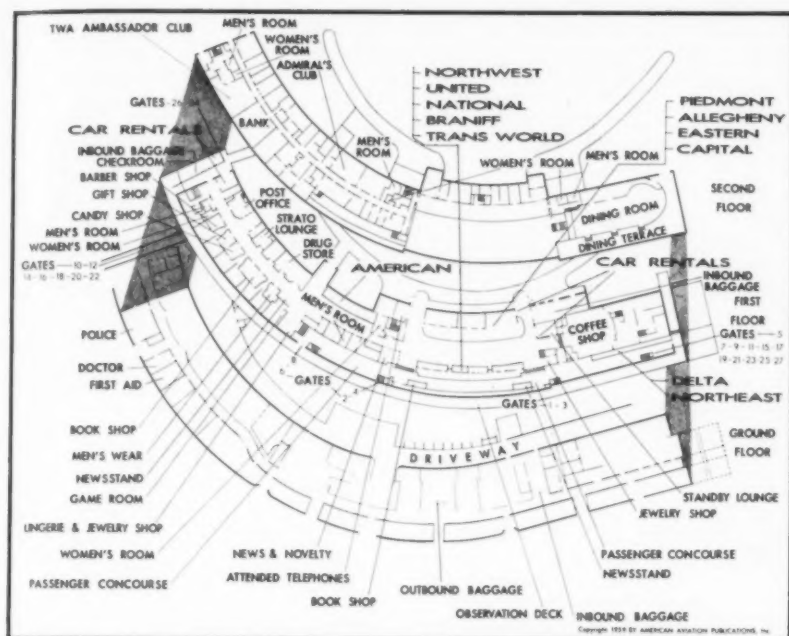
Dick Fell, who operates from an unpretentious office just off the shops in Butler's Washington hangar, was a student at Pittcairn Aviation in 1927. Later, he was a regular pilot for Pittcairn on charters and special flights and reserve pilot on the New York-Atlanta mail route, before it was purchased by Eastern Air Transport.

Pilot-salesman

In 1930, he went with Pittsburgh Plate Glass—one of the first operators of a business aircraft (a Pittcairn Mailwing, later a Travelair 6000B)—as a pilot-salesman, selling airplane dope. Incidentally, Butler now services Pittsburgh Plate Glass' DC-3.

Six years later, the late Al Williams hired Fell as eastern regional manager of Gulf Oil's aviation department, a position he held until World War II. After service as an Air Transport Command colonel, he was vice president of Capital Airlines until 1947, then left the industry for a year and a half, but returned as soon as Jimmy Doolittle told him about Butler Co. and its plans. He's been with Butler 10 years.

At present Fell not only heads the Washington operation, but is also aviation facilities manager for Butler Co. He supervises the LaGuardia operation, and is a member of Butler Co.'s executive council. In his "spare time," he's also serving this year as president of the National Aviation Club in Washington.



Terminal revenue-producing areas at Washington National Airport

How Washington National Makes Money

By MEL SOKOL

How does a profitable major airport make its money? Smart handling of concessions seems to be the answer.

Washington National Airport may not be exactly typical because it is the one major civil airport owned and operated by the federal government (FAA), but for the first time all of its income has been made public.

The figures tell a story of growing concessions and corresponding profits. During 13 of its 18 years of operations Washington National has shown an operating profit. For the past two years a profit after depreciation and interest has been reported and airport director L. W. Burton is eyeing an even bigger year in 1959.

When Washington National Airport was opened in June, 1951, it was hailed one of the finest and most beautiful airports ever built, a model for others to follow. There were those, however, who, contemplating the large, modern facility, wondered if it wasn't the biggest white elephant ever built.

The average daily 1,000 to 1,500 passengers handled during the first few years of operations could have all been easily contained in the high, main concourse of the new terminal building. Except for a restaurant, coffee shop and newsstand, there were few, if any, concession-operated passenger con-

veniences apparent. Nevertheless the airport managed to earn an operating profit during the first full year of operation and has for 13 out of the total 18 years of its existence.

Good as the record is, it was pretty much touch-and-go during the first 10 years. As will be noted from the table below, earnings were erratic; alternated with losses, despite increasing traffic. Compared with 344,257 passengers in 1941, by 1949 Washington National was enplaning and deplaning well over a million passengers. Yet, it was in 1949 that the federally-owned airport sustained its heaviest operating loss. It was not until 1952 that the red ink which kept spilling over the black during those first 10 years was eradicated. After three deficit years and a modest operating profit of \$76,946 in FY

Net Operating Profit

Fiscal years ended June 30

1942	\$ 43,269
1943	D-49,606
1944	D-24,276
1945	52,495
1946	89,752
1947	2,027
1948	D-123,392
1949	D-161,896
1950	D-27,946
1951	76,047
1952	281,656
1953	487,625
1954	550,255
1955	777,990
1956	977,822
1957	1,403,689
1958	1,776,555

D—Deficit

1951, earnings soared to \$281,656. They have been soaring ever since.

What gave earnings new wings and added lift since then has been the assiduous development of terminal building concessions. These, last year, exclusive of rent and other services, produced \$991,726 of the \$1,193,473 total revenues realized from terminal building operations. They also account for the major portion of the \$527,297 from all operations carried over into the net profit column for FY 1958, which led FAA Administrator E. R. Quesada to remark: "If the government makes money operating an airport, God knows the community should."

What are the sources of the airport's income? They number a hundred or more and range all the way from penny weight scales, among other coin-operated devices, to auto parking concessions and food establishments, two of the biggest single revenue producers. Some idea of the revenue sources which have put the airport solidly in the black is revealed in the following statistics:

Income From Concessions: 1957-1958

	FY 1957	FY 1958
Auto parking	\$268,786	\$348,918
Food sales	238,034	338,211
Insurance	132,884	182,833
Observation facilities	38,078	35,570
Concessionaires rental	17,884	20,593
Other rental	6,303	8,509
Coin-operated devices	85,603	103,207
Ground transportation	337,238	338,906
Other concessions	168,086	191,861

The more than \$600,000 grossed from auto parking in the past two years came from the 875-car parking lot concession and the 180 parking meters located on the airport. Charges to the public are reasonable: 25 cents for every three hours in the public parking area; 10 cents a half hour for meter parking at the highly congested area in front of the terminal building, and 5 cents an hour on the hangar line where visitors have business with the airlines and other airport tenants.

Revenue grossed from food sales comes from four different sources: private clubs (Admiral's Club operated by American Airlines and Ambassador's Club by TWA); the public restaurant, coffee shop and food bars within the main terminal building; three employee cafeterias; and in-flight meal services. No sale of hard liquors is permitted.

Washington National has two trip insurance concessionaires: Fidelity & Casualty Co., which has the insurance machine concession, and Airport Sales Corp., which recently won the counter

**Washington National Airport
Terminal Building Area, March 14, 1958**

Area	Airlines	Other Rental	Concessions	Total Commercial	Unrealized Rental	Public Area	WNA Administrative	Total
Ground floor	35,876	11,468	4,744	52,088	58	28,916	7,500	88,562
First floor	18,241	1,073	15,637	34,951	.....	36,600	.....	71,551
Second floor	9,970	2,602	7,668	20,240	.....	11,302	5,081	36,623
Third floor	724	845	.....	1,569	6,008	2,090	1,803	11,470
Fourth floor	.....	.....	.....	.....	1,513	.....	.....	1,513
Fifth floor	.....	.....	.....	.....	245	.....	.....	245
Sixth floor	.....	.....	.....	.....	315	.....	.....	315
Total	64,811	15,988	28,049	108,848	8,139	78,908	14,384	210,279

sales concession from Tele-Trip Policy Co. The airport gets 13% of the gross from machine sales. Its big take is from counter sales. Airport Sales guarantees a minimum of \$327,000 for the contract year, or more than the airport's total gross from insurance for 1957 and 1958.

Gross from observation facilities includes revenue derived from the 10-cent admission (none for small children) to the observation deck, viewing machines, and a Tel-O-Tronic Industries device through which visitors can listen in on tower frequencies to Washington National and other air traffic control towers.

Rental income shown in the table above is only part of the total collected on space leased in the terminal. Last year this amounted to \$144,828. Concessionaires rental comes primarily from lease of space for storage, offices, processing, employe locker rooms and the like. Other rental includes quarters

occupied by a bank, a doctor's office, and two business firms, plus the President's Room, which is used for emergencies and rented on certain occasions. Concession fees generally are based on the minimum-guarantee/percentage-of-gross formula.

All rentals are based on floor space occupied. For the 8,680 sq. ft. area occupied by ticket counters and offices, the airlines pay \$3 a sq. ft. per year.

Approximately half the 210,279 sq. ft. of floor space in the terminal building brings in rent. The balance is devoted to public areas: airport operating, control tower, and government-use facilities from which no income is realized.

Available space is no longer adequate. Now 4.5 million passengers annually pass through the terminal. That's more than the total number flown by all the airlines in 1941. Additions have been made to the building but the problem continues. Space for new and

additional concessions is at a premium. "We could have a flower shop, but we don't have the space," said Director L. W. Burton.

But with ingenuity the airport management has developed new sources of revenue. One of the latest currently is bringing in \$1,200 a month and with no floor space involved.

This is for the privilege of installing direct-line wall telephones, for which eight hotels are each paying the airport \$150 a month, and 10 or 11 others are clamoring to get in. Success of the idea stems from the manner in which it was merchandized. Instead of clustering the telephones in one spot, Burton proposed placing them around the building, allotting three strategic locations to each subscriber, with a panel alongside each instrument on which the hotel could make its sales pitch. The Statler, one of the first to sign up, states the phones reduce its cost of renting a room to 60 cents from the average \$1.10 paid in commission.

Wall ads pay off

An appreciable amount of income also is being derived from wall advertising and other displays. Fee charged is based on a percentage of gross take of the advertising agency servicing a particular account. This ranges from 10% to 30% of the agency's gross, depending on location.

Among coin-operated devices are three TV sets, located in an area of the balcony where the sound will not be disturbing to others. Biggest money makers among vending machines are those dispensing cigarettes and candy. "It's amazing the amount of business they do," said Burton. There are over 100 of these throughout the airport.

Net profit from terminal operations for 1958 was \$442,838, compared with \$84,459 from field operations. Total of \$527,297 was paid into the U.S. Treasury, as are all earnings.

Last year was the second in which the airport reported a profit after depreciation and interest. The first was 1957 when net income from all operations totaled \$66,034.

While operating income for the current fiscal year will show an increase over 1958, Burton said, net will be lower due to higher interest charges as a result of the new North Terminal building completed last fall, and taxiway and runway improvements. Total capital investment to date in Washington National is \$30 million, of which \$21 million has still to be depreciated. With the growth trend in revenues continuing, Burton sees no reason not to remain "in the black."

Terminal Income and Expense Year ending June 30, 1958

Income		
Rent	.....	\$ 144,828
Concessions	.....	991,726
Utility sales:		
Electricity	\$20,209	
Steam	123	20,332
Other services:		
Observation deck	33,931	
Paper cups	642	
Work orders	110	
Miscellaneous	1,904	36,587
Total income	.....	\$ 1,193,473
Expense		
Maintenance and operation:		
General	.....	\$47,322
Utilities:		
Electricity	97,968	
Steam	91,714	189,682
Automotive	.....	9,860
Cleaning and sanitation	.....	144,238
Supervisory and clerical	.....	18,469
Other	.....	4,605
Protection:		
Police department	56,285	
First aid unit	5,493	61,778
Administrative expenses	.....	97,067
Total operating expense	.....	\$ 593,220
Depreciation	.....	119,894
Interest	.....	37,521
Total expense	.....	\$ 750,635
Net profit from terminal building	.....	\$ 442,838



NEXT MONTH, May, is the contract month for the Douglas Aircraft Co. to deliver its first DC-8, an NX model, to United Air Lines for crew training and familiarization. No precise dates within a month are set out in the Douglas delivery schedules, so the last day of the month is on time. Since May 31 is a Sunday (following on the heels of a holiday, Memorial Day, too), this means June 1 will be O. K., and that could very well be the date a UAL crew accepts delivery on the airplane and flies it to San Francisco to prepare to swing this carrier's jet program into high gear. At this writing, the airplane—No. 8 plane on the Douglas line—is due to roll out the door April 10 and be ready for first flight the second week in May. This may seem to make delivery by June 1 a little on the tight side. It is, but Douglas is good at making schedule.

Earlier Service

The original Douglas timetable had October, 1959, down as the date for type certification of the DC-8 with JT3 engines, followed by December, 1959, for the JT4-powered airplane, and February, 1960, for the version equipped with Conway engines. But the actual target date now is August, which would enable UAL to touch off its DC-8 inaugural somewhere around September 18. Again, it would appear that the usually conservative Douglas is cutting it a little thin in its scheduling. A rule-of-thumb is to allow six months for type certification and the Federal Aviation Agency TIA (type inspection authorization) has just been issued this month. But Douglas chose to wait to incorporate all possible engi-

neering change proposals in the airplane—including the leading edge slots to compensate for the new CAR 422A requirements—before starting the official FAA flight test program—it probably will save both time and money by doing so, as well as obtain approval for better performance specifications.

Douglas, of course, has had FAA inspectors aboard as observers on a number of flights for familiarization with the DC-8 and its systems. For example, Joe Tymczyszyn, the FAA check pilot who certified the Boeing 707, was along when Douglas took the No. 4 DC-8 into the Pacific Northwest for icing tests. Moreover, from its long experience in building transport aircraft, Douglas understands the processes of FAA (formerly CAA) certification and the company's chief test pilot on the DC-8 has a background of six years as a flight inspector for the government agency. He knows exactly what the FAA will require to certify the performance and safety Douglas is guaranteeing to the airlines for the DC-8.

Fancy Lounges

Bob Six, Continental Airlines president, is dropping broad hints of innovations in passenger appeal CAL has up its sleeve for its Boeing 707 service starting between Los Angeles and Chicago on June 8. "But I can't disclose them now." He wants to be sure no competitor gets wind of what's up. But one of them will be the sexy color scheme in the lounges—including charcoal carpets and pink leather seats. The CAL 707s will have two lounges: one for first class and one for coach.

CAL will expand its Los An-

geles operations considerably for the Boeings, including a \$750,000 addition to its hangar at Los Angeles International Airport. All Boeing maintenance will be performed at Los Angeles, and CAL already has a substantial supply of 707 parts in its stockroom. In fact, its parts supply is so good that CAL, which had not yet taken delivery on an airplane, was able to help out American Airlines, which had several airplanes flying, on shortages on more than one occasion.

Swing Tail Freighters

Somebody asked W. E. Bartling, vice president-research of The Flying Tiger Line, whether a swing tail, such as Boeing, Convair and Douglas are proposing for military logistic jet transports, would have any value for a commercial cargo carrier. "I don't care where the openings are just so there are plenty of them," said Bartling.

We're not sure whether it was Convair or Douglas which first suggested the lateral swinging tail, but it is of no matter now because we understand that the Air Force has decided that this will be a requirement for any logistic aircraft of the future. And in the final analysis, when the day comes that commercial carriers are able to consider a new-type aircraft for cargo, one of the requirements no doubt will be a tail that swings laterally. It provides an opening that is virtually the constant section of the airplane.

Turbofans For More Lift

The Douglas Aircraft Co. calls its entry in the military swing tail cargo sweepstakes the Model 1920 Jetmaster. It is the DC-8 employing four Pratt & Whitney TF33-P-3W turbopan engines. This is a version of P&W's famous J57 engine in which the first three low pressure compressor stages have been replaced by two fan stages. The turbine section has been modified to enlarge the third-stage turbine, and to add a fourth stage. Commercial designation of this engine is JT3D-2.

By reducing the cruising fuel consumption, the turbopan power-plants will increase the range of the DC-8 by as much as 21% for a given payload. Design gross takeoff weight for the Model 1920 Jetmaster is 310,000 lbs. and it has a cargo capacity of 80,000 lbs. Douglas estimates it can carry an 80,000 lb. payload over ranges as great as 3,425 nautical miles at costs as low as 4.3¢ per naut. ton-mile.



ARTIST'S VIEW, Douglas' swing-tail version of the DC-8 jet.



Western Airlines has already established itself as one of the transport industry's more adept artists at wrapping things up neatly, but Terry Drinkwater's boys just about outdid themselves with their latest annual report. If you remember their 1957 report you will recall a back cover picture that just about caused an upheaval in the industry. Terry and Ken Smith, WAL's PR director, had what at first seemed a major explanation to give stockholders. But bouncing back as always, they turned this slip into one of the year's outstanding jobs with the 1958 report.

Down in the bottom righthand corner of the back cover is a picture of four of the cutest pups you ever saw! And to be sure that it would be understood, this version of 1958's edition was sent only to the group that received the first run of the year-ago report.

These aren't the only pets that have figured in the news lately, however. A story being passed around by a v.p. of another airline goes like this: The wife of a prominent newswriter was taking a trip and her expensive pet cat was traveling aboard the same plane in a kennel. Someone goofed real good and stowed the kennel and its contents in the rear, unheated compartment. Upon arrival at destination, one very dead, frozen cat was unloaded. The woman had hysterics.

Late that night the airline v.p.

got a phone call from her husband, whose almost-speechless-with-anger voice threatened suits and various other things. The v.p. apologized profusely, invited the man to his office the next morning to settle the matter. When they met, the v.p. apologized again, whereupon the husband broke in: "Look, just pay her something for the cat and let's forget it. I hate cats. That scene on the phone last night was for my wife's benefit. I've been trying to get rid of that damned animal for months!"

Before leaving the animal world, it should be noted that probably the only aircraft engine plant in the world with real live alligators on its property is the Florida Research & Development Center of Pratt & Whitney Aircraft Division of United Aircraft Corp., some 17 miles northwest of West Palm Beach in the Everglades. P&W carved a modern facility out of the swamps, one way to solve the noise problem of testing powerful engines. P&W people spot alligators driving between the main plant and the test center.

Gwin Hicks, president of Lake Central Airlines, has a story to relate about unhappy passengers, too. This one doesn't have anything to do with pets, animal or otherwise, but it is another good example of how passengers cool off sometimes when well treated.

With Lake Central passenger service starts at the top. Gwin got a phone call at home one night from an unhappy and somewhat inebriated customer. He'd been canceled out, had an LCA meal ticket for \$1.50. "Now, where in hell can a guy get a meal for a buck and a half?" he asked. Without hesitation, Hicks replied: "Right here! Come on over. My apartment's only two blocks away and my wife and I will give you a home-cooked meal—and we'll even put *two* olives in your martini instead of the *one* you've been having." Dead silence followed. The embarrassed guest apologized for calling.

A few days later, LCA received a highly complimentary letter signed "an almost devoted Lake Central customer."

This bit from Hicks stirs up other stories about food and what it costs these days. The North Atlantic carriers have finally put their sandwiches back where they belong and are moving over to cold plates for their passengers who select the less expensive trips. On the domestic side, Braniff produces an interesting study which shows that its de luxe meal averages \$5 plus beverage; the average breakfast \$1.00; the Con-vair meal \$1.50 and a DC-6 spread hits \$2.00.

As would be expected, the airlines are following a pattern that was set long ago, even though they have not yet reached the extreme set by the old Mississippi paddle-wheelers. Silverware, china and linens were generally made especially for each particular ship just as today's airlines have their own tastes when it comes to serving passengers. The riverboat menus, however, have probably never been equaled. Not even by sandwiches. In 1859, the Natchez presented an elaborate Christmas dinner menu which, in manner as gay as the season, offered 14 courses. Included were four types of fish, six broiled meats and six kinds of roasts, eight entrees and nine cold dishes, five types of game and a dazzling assortment of 36 desserts. That's something to shoot at.

Trans-Australia Airlines reports some instructions given by one aircraft manufacturer that winds things up pretty well: "For technical reasons it is necessary that these parts should be stored with the top at the bottom and the bottom at the top. In order that there may be no doubt which is the bottom for storage purposes, it will be seen that the bottom of each part has been labeled with the word 'Top.'" Nobody could doubt that.



Frederick B. Ayer & Associates has a reception room that is doing a first rate public relations job for the aircraft dealer. The room, pictured above, is a replica of a segment of the Executive Ayer-Liner. The theme follows the Ayer-Liner even to the extent of having receptionists dressed as hostesses.

A STATEMENT TO THE AIRCRAFT INDUSTRY

You have probably read in recent press announcements that Hardman Tool and Engineering Company has been acquired by The Dayton Rubber Company.

This acquisition will provide Hardman greater strength to better serve the aircraft industry by increasing the scope of its operations in all of its divisions.

Hardman's experienced personnel and engineering facilities have enabled it to lead its field by the development of aircraft seating that combines styling and comfort with strength, light weight, and minimum maintenance.

Its ability to work with airlines in the design and manufacture of distinctive custom seating is reflected in its current major production. This includes seats for the Boeing 707, Lockheed Electra, F-27 Friendship, and other jet-age aircraft.

Whatever your seating problem, consult the leader. Hardman specialists may well have the solution you are seeking right now.

Most sincerely,



C. M. CHRISTIE, President The Dayton Rubber Company

HARDMAN DIVISIONS

CORPORATE SEATING — The industry's widest selection in business aircraft seats including the latest jet custom seating.

MILITARY SEATING — Ejection and crew seats.

FLIGHT SAFETY — Helmet-mask retainer kits, shoulder harness inertia reels, instrument training hoods, cockpit monorail sun visors, map and data cases, and personnel safety equipment.

PLASTICS — Plastic laminate production of aircraft baggage and cargo handling equipment and related products.

GROUND HANDLING EQUIPMENT — Tow bars, loading ramp canopies, jet engine nacelle plugs, and other ground handling products.

PARTS & SERVICE — Hardman parts orders are filled promptly. Parts manuals issued on every new seat model. Modernization kits for older models. Field service representatives to serve you on engineering, sales, parts or maintenance problems.

HARDMAN TOOL & ENGINEERING COMPANY

1845 South Bundy Drive

Los Angeles 25, California



A subsidiary of:

Dayton Rubber



HEADQUARTERS FOR NEW IDEAS

Subsidiaries: American Latex Products Corporation; Cadillac Plastic and Chemical Company; Strato-Safety Equipment Corporation.

Tires, V-Belts, Hose, Textile Machinery Parts, Printers Rollers, Molded Rubber Products, Pillows, Mattresses, Cushioning, Plastic Rods, Sheets and Tubes, Urethanes.

from Paris to Pakistan, to

HARDMAN SEATS



Partners in Comfort WITH MORE THAN 70 MAJOR WORLD AIRLINES

HARDMAN

Siesta Luxury Line • Select Line •

HARDMAN ENGINEERING

1845 S. Bascom Ave.

from New York to New Zealand

First choice for passenger comfort



IRVING AIRLINES

IRVING Seats

• Seat Line • Executive Corporate Line

ENGINEERING COMPANY

S. 800 Los Angeles 25, California



*in the Jet Age
still the leader
in aircraft seating*



SALES TALK



New method of distributing sales promotion ideas around its system is being used by Eastern Air Lines. A series of bulletins, entitled "Sales Promotion the Easy Way," is going to all stations, each issue describing an unusual window display used by a particular office. Included are complete instructions on preparation and installation.

Newest sales incentive has been introduced by Gordon Bain, Northwest's vice president-sales. At NWA's sales conference, he told district sales managers, assistants, and reservations managers that if they make their 1959 sales quotas "I will gladly, and without hesitation, shine the shoes of each of you in the lobby of the hotel where we hold next year's meeting." He didn't say what happens if quotas aren't made.

Lots of money for a fly-and-drive advertising campaign may be available soon. Unless objections are received by Apr. 11, Civil Aeronautics Board will approve an Air Traffic Conference plan for a campaign. Airlines will go all-out in promoting car rentals by passengers. In return, car companies will pay \$1 for each rental made through an airline, and this money will go into the advertising kitty.

Catchy line used by United in television commercials—"United Air Lines, the extra care line."

First helicopter line to use miniature flight bags for sales promotion is Chicago Helicopter Airways. Bags are made by Airline Textile Mfg. Co., Des Moines, Iowa.

Delta is dressing up its DC-7s with new tufted carpets, 70% acrilan, 30% nylon, made by Cabin Crafts, Dalton, Ga. Company has tie-in trade paper ad campaigns going with Cabin Crafts and Collins Radio (jet communications equipment) . . . Delta has been using 400 billboards in Chicago, 100 in Detroit, pushing nonstop service to Miami.

People are talking about El Al Israel's full-page ad which takes a dig at jet operators. A big drawing of a goose and a gander, with the caption "No Goose, No Gander." In small type at the bottom: "No refueling stops at Goose Bay, Labrador, or Gander, Newfoundland when they fly El Al jet-prop Britannia between New York and London or Paris."

Condensed cargo reservations language is being put into use by International Air Transport Association and Air Traffic Conference. It follows the style of the passenger reservations code established in 1953. Most booking messages will be packed into 40 letters or less.

Air freight will be carried for the first time by North Central Airlines, starting June 1. Company now offers only air express service.

Gimmicks for jet passengers have been added by National. One is a "time and position computer"—for example, when you're 45 minutes out of New York, twist the dial and a little window produces the information that you're over Norfolk, Va.; 105 minutes puts you east of St. Augustine, Fla., etc. . . . Company is also using newly-designed jet swizzle sticks . . . Clever NAL direct-mail piece shows a New York-Miami map covered with a cellophane slide on which are a

piston plane and a jet leaving New York simultaneously. Pull down the slide and watch the jet reach Miami in half the time.

Now that IATA airlines have the okay to serve cold meals instead of sandwiches to Atlantic economy passengers, here's what Air France has to say: "This will mean good French bread with lots of butter, delectable chicken or other meat or (for those who prefer it) fish, salad as only the French know how to make it. Rocquefort or Brie or some other cheese equally famous, and your choice of soft beverage."

Two airlines remembered Valentine Day. United fashioned its in-flight printed menu into an attractive card, with room for message, that could be folded and mailed. Delta sent a special Valentine card to secretaries of its leading accounts.

"Fiesta Flights" to Mexico by Western are going all-out in the in-flight service department. Liquor service, champagne, hot and cold hors d'oeuvres, full course meal, topped off with dessert from a "fiesta cart"—parfaits and French pastries.

National and Trans-Canada Modernizing Reservations

National Airlines has put its electronic reservations system into operation, and Trans-Canada placed \$2 million in equipment orders for a system to be in full use in three years.

NAL's Teleregister installation couples agents' handsets with a memory drum in Miami. Agents can request space, sell or cancel it, and obtain information on flight arrivals and departures. Handsets are installed in nine of NAL's principal cities, with other points connected to the drum by teletype.

TCA's order went to Ferranti-Packard Electric Ltd., Toronto. An agent inserts a pencil-marked card in the handset, requesting a reservation. Information comes back from the central computer to the handset, causing it to punch a hole in the edge of the card. This provides the answer to the request.

UAL Readies Fast Jet Check-In



United's express check-in at Seattle is shown above. Passenger flow is from rear to front. Agent at far right is the expediter (conveyor belt is to the left around the corner), one in middle is behind the Detecto scale. Position on left is for payment of excess charges.

An already-ticketed jet passenger enters the airport terminal, picks a baggage tag from a box, puts it on his bag, has the bag weighed, and he's through.

This is "Express Check-In," United Air Lines' answer to the problem of long waiting lines in handling passengers for 110-seat jets.

The system, or a modification of it, will be used at all points served by UAL jets. An experimental unit has been in successful operation at Seattle for some time.

The passenger with no excess baggage completes the process in less than a minute. He then proceeds to a waiting room near the gate, and his ticket is checked as he enters. This staggered loading is also expected to eliminate

lines at the waiting room door. UAL lifts tickets aboard the plane.

Express check-in will start 12 ft. from the terminal door. After affixing the tag, the passenger puts his bag on a conveyor belt to the scale. If he's an inexperienced traveler, a UAL "expediter" will help him with the tag. If he isn't ticketed, or has other problems, the expediter refers him to a conventional counter off to one side.

The scale used—made to UAL's specs by Detecto Scales Inc., Brooklyn—is a \$10,000 job. If a passenger has excess, the agent cranks destination information into the scale and the unit issues a ticket with the excess charge computed. The passenger pays at another position.

ABOUT PEOPLE

FRONT OFFICE

Charles A. Rheinstrom of American Airlines and **Sam J. Solomon**, formerly president of California Eastern Aviation, both recently made headline news. Rheinstrom, who returned to American a year ago this month as executive v.p.-sales, has been elected chairman of the board of Helio Aircraft Corp. Helio manufactures the Courier, the only certificated STOL airplane that meets military standards. His responsibilities at American remain unchanged, however.



Rheinstrom



Hardesty

Solomon, who headquarters in Washington, D.C., resigned from Cal Eastern to establish Mission Aviation Corp., Mission, Texas. Long active in aviation, his new company will bid for contract flight training for the USAF. Cal Eastern has been engaged in this work for several years under Solomon's supervision. He now will be a direct competitor.

Rudolph W. Hardesty also made front office news with Capital Airlines. He has been elected v.p.-ground operations by the board of directors. Hardesty has been with CAP and its predecessors since 1935 and rose to his new position from a start as operations and traffic agent. Prior to his new appointment he was asst. v.p.-operations.

Frederick H. Vahlsing, chairman of the board of F. H. Vahlsing, Inc., has been elected to the board of directors of Seaboard & Western Airlines, the first new board member to be elected since 1948.

John H. Spencer, who was once described by author John Gunther as the "most important non-Ethiopian in Ethiopia," has been elected to the board of directors of Ethiopian Airlines.

IN THE AIRLINES

John W. Colthar, formerly director-schedule development for American Airlines, has been picked by National Airlines for asst. v. p.-schedules.

John L. Brown is also in the news at Capital, having been named asst. to the v. p.-customer services. He joined CAP in 1943 and in his new spot will be responsible for evaluating the performance of Capital's deluxe VIP service and initiating necessary improvements.

Captain Harvey H. Johnston and **W. Arnold Andrew**, both of whom have been with Canadian Pacific Air Lines since 1942, have moved up the ladder with CPA. Johnston, formerly superintendent of flying, has been appointed director of flight operations, and Andrew moves up to assistant from his former position of manager-flight technical services. Johnston has played an important role in introduc-



Johnston



Andrew

ing turboprop aircraft into CPA's system and was in charge of several Britannia deliveries.

Scott C. Whitney has become a member of the Washington, D.C. staff of American Airlines. As an asst. to the v. p., he will work with **Dwight Taylor**, asst. v. p. in charge of the Washington office. Before joining AA, Whitney was with Frontier Airlines as v. p.-legal.



Whitney



Yawn

Archie D. Yawn, who has been in various sales spots with Southern Airways since its beginning in 1949, has been appointed general sales manager for the carrier. He was serving Southern as sales promotion manager at the time of his appointment.

Captain Howard W. Phillips, one of Hawaiian Airlines' senior pilots and one of the best known pilots in the islands, has been appointed director of flight operations, succeeding **Capt. Budd M. Murray**, who has returned to active flying. Phillips started flying with Hawaiian in the days of the old Sikorsky amphibians and for the past two years has served as chief pilot for the company.

Joseph A. Verini, formerly agency manager in New York for Air France and for the past four years New York district sales manager for Swissair, has been appointed traffic and sales manager for Alitalia covering North America.

Clem Akina, Jr. has also been moved at Hawaiian Airlines. A 13-year veteran, Akina has been named director of traffic and sales for the company. Besides being known for his airline career, he is also one of Hawaii's champion swimmers.

Enrique J. Fierro has joined Aerolineas Argentinas as general representative for North America. Prior to making this move he served as commercial manager for Aerolinas and before that was with Pan American World Airways and with Swissair.

AMONG SUPPLIERS

W. Gifford Myers, a veteran of 18 years with Lockheed Aircraft Corp., has been elected corporate vice president of

sales. At the time of his election, Myers was serving as executive asst. to the executive manager of Lockheed. At one time he was manager of the company's Dayton, O., office and also served as director of sales for the Georgia division.

Marion Maxfield succeeds **R. James Pfeiffer** as director of F-27 commercial sales with Fairchild Engine and Airplane Corp. Maxfield has been in the aircraft industry for a number of years and formerly was with Glenn L. Martin Co., Curtiss-Wright Corp. and Hughes Aircraft. He has been director of customer relations with Fairchild.



Scott



Bhore

I. M. Scott has been appointed to the new post of chief engineer, Aero Div. of Rolls-Royce of Canada and is succeeded in his previous position as sales manager-Aero by **K. J. Bhore**. The two moves were made as part of Rolls-Royce's broadening program in North America in connection with its engine utilization.

HONORS AND AWARDS

C. E. Woolman, president of Delta Air Lines, will receive the Illini Achievement Award at June commencement of the University of Illinois. A 1911 graduate of Illinois, Woolman is being honored for building the nation's first aerial crop dusting company into the sixth largest airline in the United States.

Douglas Campbell, v.p. and general manager for Panagra, received a gold pin at a luncheon given in his honor for 20 years service with the airline.



AIRLIFT publisher honored. With a record-breaking attendance of almost 400 persons, **Wayne W. Parrish**, president and publisher of American Aviation Publications, was honored as the Man of the Month by the National Aviation Club in Washington on March 18. **Richard E. Fell**, club president, left, presents the plaque above.



Trans-Texas, Southern Get Major New Routes

Major local service route awards totaling 2,163 miles have been made by Civil Aeronautical Board.

The new routes will increase the size of Trans-Texas Airways' system by 41% and will add 13% to Southern Airways' routes.

The 1,752 new miles awarded TTA, increasing its system to 6,009 miles, are as follows:

Houston to Memphis via Beaumont/-Pt. Arthur, Tex.; Lake Charles, Alexandria and Monroe, La., and El Dorado, Pine Bluff and Little Rock, Ark. Award is for five years.

Shreveport to New Orleans via De Ridder, Lake Charles, Lafayette and Morgan City, La. Award is permanent in nature.

Little Rock to New Orleans via El Dorado, Alexandria and Lafayette, for five years.

Houston to Jackson via Beaumont/-Pt. Arthur, Lake Charles, Alexandria and Natchez, for five years.

Southern Airways' 411 new miles (new system total, 3,561 miles) are on a route from Memphis to New Orleans via Oxford/University City, Greenwood and Jackson, Miss., and Bogalusa, La. Award is five years, and Delta is suspended at Greenwood as long as Southern serves that point. All the awards, made in the South Central Area case, are effective May 19.

CAB Approves Some Fare Boosts, Rejects Others

Three important actions affecting airline fares have been taken by CAB.

In separate orders, the Board:

1. Indicated it will disapprove first-class fare increases on the north and central Pacific proposed in International Air Transport Association resolutions.

2. Approved jet surcharges and fare increases on the Atlantic and within the Western Hemisphere.

3. Solicited comments from all interested parties on proper methods of pricing jet services.

IATA proposed a first-class fare increase of \$50 one-way on north, central and south Pacific routes, and a tourist fare hike of \$20 on the south Pacific. CAB said reports of Northwest and Pan American show "no economic justification" for the first-class increase between the U.S. west coast and Tokyo/Manila and beyond. It went along with the south Pacific first-class increase, stating that this brought

the fare level up to that on the central Pacific. Action was deferred on the IATA resolutions "with a view toward eventual disapproval" of the north and central Pacific tariffs.

On the Atlantic, jet surcharges of \$15 one-way economy and tourist and \$20 first-class and deluxe were approved, plus a \$5 one-way increase in economy, tourist and first-class fares (\$15 deluxe). For New York to Rio de Janeiro and Buenos Aires, a \$20 surcharge was approved.

Its approval, CAB said, is only for a year started Apr. 1 in which "the major transition to jet operations should be accomplished." Another reason for approval is "the present uncertainty as to the impact which jet services will have upon the industry . . ."

Asking comments on jet pricing, CAB noted it had okayed extra jet charges by American Airlines. "The transition to jet services and integration of such services into the fare structure in an economically sound manner presents a difficult and complex problem about which differing views have been expressed," it said. The problem will be before the Board again soon, due to expiration of many tariffs on July 31.

Southern Transcontinental Service Case Hearings Set

Dates have finally been set for what will be one of the hardest-fought hearings in CAB history—the Southern Transcontinental Service Case, involving 10 airlines and routes from California to Florida.

Hearings will last more than two months, and final decision may be two or three years away. Here's the hearing schedule, with Examiner Edward T. Stodola presiding: May 5, Shamrock-Hilton Hotel, Houston; May 20, U.S. Post Office and Court House Bldg., Los Angeles; June 15, Seville Hotel, Miami Beach; July 1, Universal Bldg., Washington, D.C.

ROUNDUP OF ACTIONS

APPLICATIONS

Trans World Airlines sought CAB approval of day-by-day lease of 11 Boeing 707-131 jets from Hughes Tool Co., with cutoff date of June 30, 1959. Lease is apparently a temporary one, giving the companies time to work out a permanent arrangement. TWA will pay \$2,500 per day per plane.

Northwest Airlines and Douglas Aircraft Co. asked approval of purchase of five DC-7Cs by Douglas from NWA. Douglas agreed to buy the planes or take them in trade on five DC-8s purchased

by NWA. Price for each DC-7C is \$1,525,000 less \$6,250 for each month NWA has owned the aircraft.

ACTIONS

CAB Office of Compliance docketed a complaint against S.S.W. d/b/a Universal Airlines, asked CAB to suspend the supplemental carrier's letter of registration and its interim operating authority. The compliance attorney asserted the company is "demonstrating a complete disregard" for the public and has committed "knowing and willful violations" of the Act.

CAB refused to accept a Post Office Dept. letter supporting Seaboard & Western's application for a certificate change to carry Atlantic mail. During hearings, the PO said S&W's services were not needed. CAB said the case was closed and the letter was "untimely filed" without good cause.

Change in CAB regulations allows air carriers to provide local air transport between points to which they normally cannot operate for persons in need of emergency medical attention and attendants.

Merger of Resort Airlines of North Carolina into Resort of Delaware approved. New certificate will be issued to Delaware company.

Southern Airways' proposed roundtrip excursion fare for college students will be investigated. Tariff was suspended until June 17, 1959, following protests by American and Delta. Proposed roundtrip is 133% of regular one-way fare.

Four IATA resolutions were approved. They cover ticket time limits and reconfirmation procedures, and are effective for a year from Apr. 1.

Aerovias Sud Americana granted permission to suspend cargo service at Havana until Sept. 30, 1959 . . . Caribbean Atlantic denied an exemption to engage in air transport between Ciudad Trujillo, Dominican Republic, and Port-au-Prince, Haiti, via Cape Naiten . . . National Airlines received authority, until Nov. 18, 1959, to serve West Palm Beach on flights serving Ft. Lauderdale, provided it does not serve any point between West Palm and Washington, D.C., and does not offer West Palm-Ft. Lauderdale service.

MAIL RATES

Frontier Airlines' temporary mail rate will be increased by \$180,223 to \$2,776,805 for the period Oct. 1, 1957 to Sept. 30, 1958. Beginning Oct. 1, 1958, rate will be \$2,805,806 break-even need plus \$38,332 interest expense, or a total of \$2,844,138.

Bonanza Air Lines' break-even need for the period July 1, 1957 to Dec. 31, 1958 was increased \$213,000 to \$2,654,643. Annual mail rate starting Jan. 1, 1959 will be \$1,770,342, consisting of \$1,758,775 break-even and \$11,567 interest expense.

Alaska Coastal Airlines' temporary mail rate is proposed by CAB at \$556,501 a year, starting Oct. 1, 1958. This is a \$90,000 increase over current pay.

NOW LEASING
Last of Southern California's jet
AIRPORT
INDUSTRIAL
SITES

40 minutes from
downtown Los Angeles

Ontario International Airport now offers choice single or multiple-acre sites adjacent to runways for long-term lease.

- Fog-free progressive jet airport served by 3 airlines, 3 transcontinental railroads.
- Strategically located on Los Angeles freeway system.
- Ideal residential, recreational and cultural facilities.
- Ample labor force and utilities.
- Airport neighbors include General Electric, Lockheed Service Corp., and Aerojet-General Corp.

Act today. Write for complete details to:

Ontario MUNICIPALLY OWNED
INTERNATIONAL AIRPORT

Tom Flaherty, Mgr. • YUkon 6-6123
Ontario, California

Circle No. 26 on Reader Service Card.

AMERICAN AIRLINES
FIRST WITH JETS
ACROSS THE U.S.A.



**FOR SPRAYING DE-ICING AND
WASHING FLUID ON PLANES
AND MAINTENANCE EQUIPMENT**

STRAHMAN NOZZLES
ARE DESIGNED TO REACH
HARD TO GET AT PLACES



STRAHMAN VALVES, INC.

16 HUDSON STREET NEW YORK 13, U.S.A.

Circle No. 27 on Reader Service Card.

PAR AVION

By **ANTHONY VANDYK**

• **KLM creates a stir**—KLM has created some consternation among its competitors by advertising through services between various European points via Amsterdam. The flight number changes at Amsterdam but the same aircraft continues. Transit passengers are allowed to remain in the plane during the 20 minutes on the ground at Amsterdam. Under this system, KLM provides through services between London and three cities in Western Germany (Hamburg, Frankfurt and Nuremberg) and between Paris and Hamburg. This is the first time that a European carrier has advertised through one-plane intra-European flights via its home base. However, several airlines have been performing similar operations between the U.S. and European (and even Near East) points beyond their home bases.

• **No crews for Caravelles**—Crew shortage is one reason why Sabena is delaying its plan to order a fleet of Caravelles. The Belgian airline this year is having to take crews off scheduled operations to train on the Boeing 707, which is due to start service next February. To switch more crews to Caravelle training would mean having to cut down on scheduled services. Therefore, the Belgian airline plans not to introduce the Caravelle before the beginning of 1961 at the earliest—in other words Caravelle crew training will only start when 707 crews are trained. The aircraft that Sabena will probably get from Sud Aviation will be Caravelle 6s, the most advanced version of the Avon-powered series. However, it is possible that Sabena will be the first airline to operate the projected "Super Caravelle" using the Rolls-Royce RB 141 by-pass as powerplant.

• **Extra 'bite' resented**—Britain's decision to up the "passenger service charge" for travellers leaving state-owned airports has been greeted with no enthusiasm by either passengers or carriers. This "bite" is now \$1.05 instead of 70 cents. The British government has also increased landing charges by an average of some 28%, which has thrown operators' costing estimates for a

loop. In the fiscal year through March 31, 1958, landing charges and passenger service charges yielded some \$7 million to the Ministry of Transport and Civil Aviation.

• **Swissair studies feeding**—Swissair is conducting time and motion studies on feeding passengers in jet transports. We were among the guinea pigs recently wined and dined in the airline's Convair 880 mock-up after visiting the adjacent DC-8 dummy fuselage. The mock-ups are used to train cabin attendants in serving meals in the jet age. Swissair plans to increase its staff of stewards and stewardesses from the present 200 to about 400 by 1970. Incidentally, Swissair's Zurich kitchens last summer prepared 2,500 meals. In 1960 the figure is estimated to be 3,300, rising to 5,400 in 1956 and to 7,500 in 1970. New flight kitchens are being built by Swissair in New York, Geneva and Zurich.

• **Winter raised havoc**—Last winter was about as bad as any recorded for delays due to weather, European carriers report. We had personal experience of this. On one occasion it took 19 hours to cover the 200-mile distance from Geneva to Paris. Passengers by air expect—and get—plush treatment when weather or mechanicals delay flights, even short ones like this. Yet, when using surface transportation passengers take delays without insisting on being wined, dined, lodged and entertained by the railroad or steamship company. The same applies to the VIP treatment that many passengers expect when travelling by air. Some regulars insist that they are greeted not only on departure and arrival but at en route stops.

Because of the competitive situation they usually get their way. But how many of them would ever dare to suggest that the manager of the United States Lines at Southampton greet them during the few hours that the ship is alongside the dock en route from New York to Le Havre? And who would demand that a top railroad official pay his respects to the VIP while the Washington-New York train makes its brief halt at Philadelphia?



Recognizing the increased role of ground support equipment in jet transport operations, AIRLIFT, each month, will bring you the latest developments in each type of equipment available. Featured here are towing tractors.



Con-Diesel

Manufacturer: Consolidated Diesel, Electric Aircraft Equipment Division, Stamford, Conn.; **Powerplant:** optional choice of gasoline engines; **Friction transmission:** hydraulic fluid pumped into wheel units; **Comments:** Has optional remote steering for control from airplane cockpit. Top speed is five miles per hour.



Silent Hoist TowKar

Manufacturer: Silent Hoist and Crane Co., Brooklyn, N.Y.; **Powerplant:** gasoline or diesel engine; **Drawbar pull:** 20,000 to 30,000 lbs.; **Comments:** Automatic transmission, power steering. Can travel 20-26 mph unloaded. Three units have been ordered by Pan American.



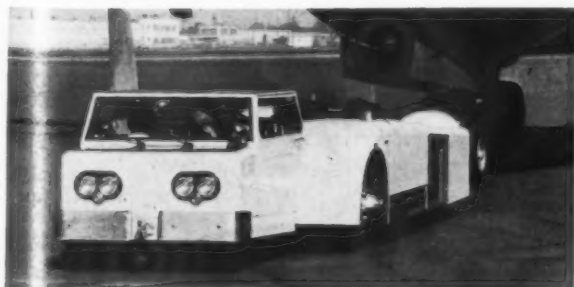
Kenworth Aircraft Towing Tractor

Manufacturer: Kenworth Motor Truck Co. Division of Pacific Car and Foundry Co., Seattle, Wash.; **Powerplant:** Continental S-6820, rated at 290 hp on automotive gasoline; **Drawbar pull:** 25,800 lbs. static for 43,000 lb. ballasted tractor. Pull at 10 mph; 5,625 lbs.; **Comments:** Allison manual transmission. Available with 4-wheel or 2-wheel steering in straight or crab steer. Unloaded speeds to 30 mph.



Napco Turbo-Tug

Manufacturer: Napco Industries, Inc., Milwaukee; **Powerplant:** Boeing 502-10C gas turbine, future models to have optional 170 hp Model 16427 Continental; **Friction transmission:** serrated drums chain driven from rear axle; **Comments:** Can pull 300,000 lb. airplane at 30 mph. Continental-powered version will pull to speeds of 10 mph. Turbine model also drives alternator, compressed air for starting, pneumatic checks, wing device.



Air-Log Pilot

Manufacturer: Air Logistics Corp., Pasadena, Calif.; **Comments:** Can be steered from within in either direction, or by airplane pilot. Capable of towing 300,000 lb. airplane up to 25 mph. Can tow from main gear or nose wheel attachment.



Paymover Model TS-300S

Manufacturer: Frank G. Hough Co., Libertyville, Ill.; **Powerplant:** optional; **Drawbar pull:** 30,000 lbs.; **Comments:** Features 2- or 4-wheel steering, reversing transmission, power brakes. Can crab 25 deg. Travels 26 mph, unloaded. American Airlines has ordered 15 units.

*Trainer to X-15...
and beyond*

ALL fly with Fluoroflex®-T hose of Teflon®

There's performance to spare in Fluoroflex-T hose assemblies. High temperatures? They serve to 500°F... and beyond, in some cases. High pressures? They've passed rigid tests even for 4000 psi systems. Long impulse life? They're tested to 250,000 cycles... more than *double* industry standards. Optimum reliability?

They've been flying for more than five years in jet and reciprocating aircraft.

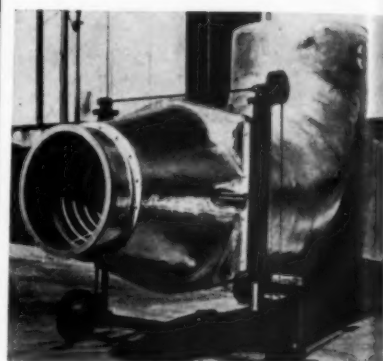
That's why Fluoroflex-T hose assemblies are favored for fuel, lubrication, hydraulic, escape and fire control systems in so many existing aircraft. And that's why they're being specified for so many aircraft now being designed — they have performance to spare.

For data, write Department 241,
RESISTOFLEX CORPORATION, Roseland, N. J.
Other Plants: Burbank, California; Dallas, Texas.

© Fluoroflex is a Resistoflex trademark, reg., U.S. pat. off.
© Teflon is DuPont's trademark for TFE fluorocarbon resins.

RESISTOFLEX

Circle No. 28 on Reader Service Card.



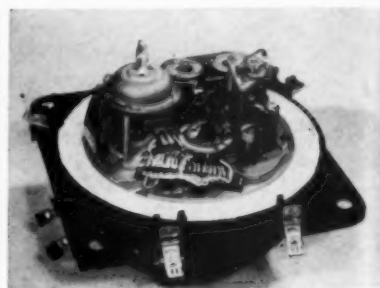
Jet Silencer

Metal Products Division of Koppers Co., Inc., Baltimore, Md. has developed a portable jet silencer mounted on wheels for towing. The unit need not be attached to the engine, and can be positioned in less than two minutes.

Called the Portable Run-Up Silencer, it is designed to inhibit noise rather than suppress it. It provides 30 db reduction, which is equivalent to a 90% reduction of impact to the eardrum.

The silencer is lined with spun mineral wool fibres to cut heat transfer from the engine exhaust. This lining is constructed to withstand a temperature of 800°F, and hold the external skin temperature to 200°F. An aluminum-faced asbestos cloth is applied to the outside of the unit for weather protection.

Circle No. 160 on Reader Service Card.



Flight Recorder

Lockheed Aircraft Service, Inc. has received orders from four U.S. trunk airlines for 81 flight recorders, bringing the total number of units sold to more than 140. The LAS recorder is now being used by Pan American and American Airlines on 707 flights. New buyers are TWA, Braniff, Delta, and Continental.

The recorder measures barometric altitude, vertical acceleration, compass heading, and time intervals. An optional coder can be added to give digital information such as flight number and date. Post flight analysis of the recorded data allows evaluation of stress loads caused by turbulence or landing shock without tedious structural inspection.

Instrument is housed in a split spherical shell and mounted to a rigid airframe member through a Lord mount. Sensing elements for altitude, acceleration, and airspeed are contained in the shell, and

AIRLIFT

heading information is obtained through a servo follower system connected to the aircraft fluxgate or gyrosyn compass.

Except for the heading, which is electro-mechanically driven, styli are mechanically linked to the sensors and move vertically across a foil tape. Instantaneous styli positions depend on the magnitude of the parameters being sensed.

Tape is driven continuously by an electric motor through an escapement and gearing. Recorder is actuated by 400 cycle power, and all intelligence except heading will continue recording after power removal for a period of ten minutes. Tape spool is 100 ft. long, providing about 150 hrs. of recorder operating time.

For crash analysis, the unit is constructed to withstand 100G shocks, salt-water immersion, and flame temperatures of 1,100C.

Circle No. 161 on Reader Service Card.



Engine Starter

A combination cartridge and air starter for jet engines, as shown above, has been developed by Sundstrand Aviation, division of Sundstrand Machine Tool Co., Rockford, Ill.

The starter permits engine starting by solid propellant firing, cross bleed from another engine, or use of ground cart compressed air for initial power source.

A centrifugal compressor, integrated with the turbine wheel, provides automatic limiting of turbine speed without the use of valves, switches, or servo-mechanisms. A pressure limiting valve provides safety during the firing operation, and also controls breech pressure to minimize variations in performance at temperature extremes.

Conventional spur gearing is used with the starter, eliminating any planetary gear arrangements. Total weight of the unit is less than 50 lbs.

Circle No. 162 on Reader Service Card.

Jet Analyzer

Scintilla Division of Bendix Aviation, Sidney, N.Y., has designed a turbine-engine analyzer that will sense temperature and vibration conditions at critical points of jet engines. The instrument is being

developed in cooperation with BOAC for use on Rolls-Royce Conway-powered 707s. Information from 10 temperature and two vibration stations is transmitted to the flight engineer.

BOAC has ordered 20 analyzers, with delivery scheduled to begin the latter part of this year.

Circle No. 163 on Reader Service Card.

Temperature Control

Chandler-Evans, West Hartford, Conn. is making the cabin air temperature control assembly for the Boeing 707-120 and 331 series.

Complete assembly consists of three six-

inch diameter valves controlled simultaneously by an electric actuator. Two of the valves control cold air supply and one valve controls supply of hot air. Mixed hot and cold air is directed to the passenger compartment through a common channel.

Compartment temperature is thermostatically controlled.

The butterfly valves, built to be interchangeable, can move through 90 deg. travel in 40 sec. time, at temperatures ranging from -65F to 165F.

Actuator gear ratio has been set at 20,000 to 1 for rapid starting and accurate timing with a backlash of less than one-tenth deg. Weight is 13.4 lbs.

Circle No. 164 on Reader Service Card.

*In case of emergency,
crew and passengers
DEPEND on SIERRA®
personal emergency oxygen equipment**



The Model 232 Crew Mask



The Model 289-01 Passenger Mask



Crews and passengers alike on many of America's new jetliner fleets will depend on Sierra Personal Oxygen Equipment—in case of emergency. Pioneer in personal oxygen gear, Sierra has produced a new and unique system which enables crew members to be individually fitted with a comparatively inexpensive oronasal mask which remains their personal property. The breathing tube, with microphone and valves remains permanently in

the aircraft. In operation, the crew member simply attaches his mask to the breathing tube by means of a bayonet connector. An inexpensive, simple, yet effective breathing bag and universal face cup arrangement efficiently provides for passengers in case of emergency. You are invited to write for complete information. A technical paper reprint on oxygen mask suspension will be included.

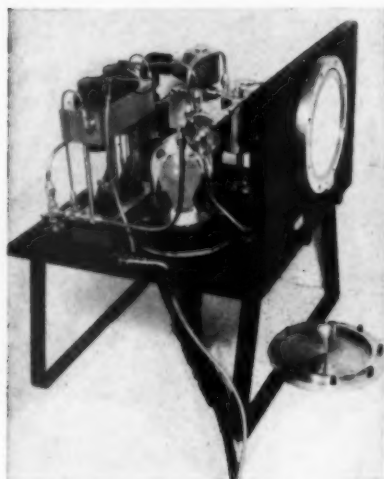
*SIERRA CREW AND
PASSENGER MASKS
COMPLY WITH CAA
REGULATIONS



123 E. Montecito Sierra Madre, California

Circle No. 29 on Reader Service Card.

NEW PRODUCTS



Purity Meter

Bowser, Inc., Ft. Wayne, Ind. has developed a monitoring device to measure the contamination level of jet fuel as it is delivered to the airplane. Called the Purity Meter, the device samples all the fuel delivered and gives a continuous reading of the contaminate material contained.

Purity Meter operates on the light scattering principle. Light scattered by solid particles in the fuel is measured and compared to the scattering of a sample of the same fuel which has passed through an extremely fine filter.

The instrument consists of a pick-up and indicating assembly. An electric cable is the only connection between these assemblies, so they can be placed any distance apart and located at any desired point in the fueling system.

The pick-up contains an ordinary light bulb, two photometric tubes, and the special sample filter and calibration devices. One photo tube measures light scattered from the fuel as it leaves the hydrant, and the other measures that from the filter.

The difference in the two readings is shown on the indicating assembly, which is calibrated in an arbitrary scale of ten units. Indicating assembly is transistorized.

A pointer on the indicator scale can be set to the tolerable contamination level, and the alarm—visual or sound—will go on only if the metered fuel exceeds that level. A recorder is provided to make a record of contamination throughout the fueling process.

Purity Meter is designed to operate from a 110v, 60 cycle line. Total power consumption is approximately 75w. Light source is a 60w bulb in an explosion-proof housing.

Tentative orders have been placed by the RCAF, and the U.S. Army Research Test Center is currently evaluating the unit. Naval Bureau of Ships is conducting studies of the Purity Meter aboard aircraft carriers to determine the number of units required, and the best location for them.

Unit is priced at \$3500, but will be reduced when more orders are received.

Circle No. 100 on Reader Service Card.

New Refueling System

Parker Aircraft Co., Los Angeles, has demonstrated its new high-flow hydrant refueling system for jets.

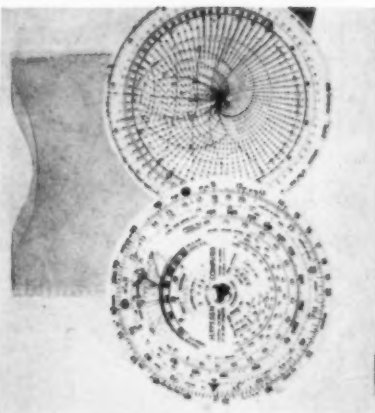
Fuel is stored in underground tanks of up to 1 million gallons capacity and pumped to a hydrant coupler on the parking ramp. From this hydrant a main 3-4 in. hose runs to a hydrant vehicle or cart which contains filtration equipment to strip the fuel of any water content.

The recessed hydrant contains control devices to regulate fuel transfer rate, and govern pressure in the fueling system. A "deadman" lever is provided as a safety device. The refueling operator must depress the lever at all times, and the fuel flow stops when it is released.

Three separate hoses lead from the hydrant to the vehicle. The main hose carries all the fuel being pumped, while a second hose contains air pressure and serves as the primary control source for the fuel pressure and supplies energy for emergency shut-down. The third hose contains fuel and acts as the means of sensing distant pressure between the hydrant source and the vehicle.

Ability to supply variable pumping pressures is achieved by an air pressure regulator in the vehicle which can be preset by the ground crew. Pumping pressures normally range from 30 to 50 psi.

Circle No. 101 on Reader Service Card.



Computer

Jeppesen & Co., Denver, is selling a new navigational computer designed for the increased speeds and altitudes of jet aircraft.

Called the CB-1, the computer was designed by an airline pilot, and is now being used by American Airlines. It is usable for ground speeds up to 1,650 kts. and wind velocities to 250 kts.

Typical problems that can be solved with the CB-1 include true airspeed, time-speed-distance, headings and ground speeds, crab angle, winds aloft, Mach numbers, density altitudes, pressure patterns, fuel burn-out, on-course corrections, temperature rise, and many others.

Computer can also be used in light business-type aircraft. It is 4½" in diameter, and sells for \$8.70 including case and instruction manual.

Circle No. 102 on Reader Service Card.



Aluminum Ladder

Ballymore Co., West Chester, Pa. has made a folding aluminum ladder which can be collapsed and stored when not in use.

Available in three, four, and five-step models with handrails, the ladder has ball-bearing retractable casters and rubber-tipped corner supports on all sides.

Circle No. 103 on Reader Service Card.

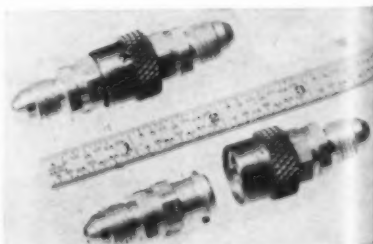
Life Saver

Garrett Corp.'s Air Cruiser Division, Belmar, N.J. has developed an air flow system which inflates a 25-man airborne life raft in less than nine seconds.

Key component is a jet air pump. Compressed air is injected through the pump, which uses a venturi effect to draw atmospheric air at a volume sufficient to inflate the raft. The pump reduces by 75% the time required to inflate with CO₂ cylinders.

Weight and size of the pressurized cylinder is cut by the use of atmospheric air in conjunction with 3,000 psi compressed air.

Circle No. 104 on Reader Service Card.



Coupling

Aeroquip Corp., Jackson, Mich. has a miniaturized coupling only 2½" long and weighing a little more than ½ oz.

Called the 1010 coupling, it uses a bayonet-type lock, with each half sealed by Viton A "O" rings. Design exceeds requirements of MIL-C-7413 and has an operating range of -65F to 375F with operating pressures to 1,500 psi.

Circle No. 105 on Reader Service Card.

HELICOPTER FLOATS

another product of Air Cruisers' research



Versatile, Dependable Flotation Gear

Air Cruisers' inflatable flotation gear provides safe landings for helicopters on land or sea. Utility floats like those shown above provide *eight* completely separate buoyancy chambers for stable landings on water supporting pay loads up to 5200 pounds of buoyancy. Yet because of low operating pressures inside their tough, laminated rubber and nylon construction they can withstand landings on the most rugged terrain. They weigh only 18 pounds each.

Helicopter flotation gear manufactured by Air Cruisers includes utility floats, fixed

emergency floats already inflated, and floats which are normally stowed around the landing gear and can be inflated for emergency landings in seconds with a unique jet inflation system. Dependable, lightweight and simple to inflate, Air Cruisers' floats can be custom made to meet specific requirements.

The pioneer developer of flotation gear of all types for helicopters, Air Cruisers is America's most experienced fabricator of inflatables from rubberized nylon materials—the only manufacturer which conducts continuous research in survival equipment.

ENGINEERING REPRESENTATIVES: AIRSUPPLY AND AERO ENGINEERING, OFFICES IN MAJOR CITIES



AIR CRUISERS DIVISION

BELMAR, NEW JERSEY

LIFE JACKETS • LIFE RAFTS • HELICOPTER FLOATS • ESCAPE SLIDES • GAS BREATHING BAGS • DECELERATION BAGS

APRIL, 1959

Circle No. 6 on Reader Service Card.

71

NEW PRODUCTS

Doppler Navaid

Bendix Radio Division has developed a new doppler radar navigation system for jet and turboprop aircraft which gives the pilot drift angle and ground speed information.

Drift angle reading can be made up to 40 degrees, left or right, with plus or minus ½ degree accuracy, and the ground speed indicator covers a 100 to 1,000 kts. range with accuracy to within 0.6% plus one knot. The equipment will operate at altitudes up to 50,000 ft.

Called DRA-12A, the system features a completely "passive" radar antenna which requires no gyro stabilization for airframe pitch and roll, and needs no rotating machinery for steering. The antenna is a flat, four-beam polar array, which permits installation in shallow wing and fuselage recesses. A sequential switching circuit senses the doppler frequency shift in each of the four beams, and switching is done by use of ferrite rotators which eliminate the need for mechanically-rotated types.

The system is an FM/CW type, operating at 8,800 megacycles, and uses a



OVER **192,000** PASSENGERS
HAVE FLOWN
THIS ROUTE



WIN MORE CUSTOMERS . . .

ROUTE THEM VIA CHA!

NO FASTER WAY . . . NO GREATER CONVENIENCE

- just 9 minutes Midway to Downtown . . . 11 minutes from O'Hare
- 103 scheduled flights daily
- comfortable 12-passenger Sikorsky S-58s
- full interline service
- baggage checked to final destination . . . all on one ticket

REQUEST RESERVATIONS THROUGH STANDARD
INTERLINE CHANNELS

CHICAGO HELICOPTER AIRWAYS, INC.

modulation technique that eliminates "altitude holes" normally associated with all but pure CW type doppler radars.

The transmitter tube and power supply and the receiver are shelved in a 3/8-ATR package along with modulation and beam switching circuitry. The unit is completely transistorized except for the klystron. The frequency tracker which determines the doppler frequency shift in each beam, and the computer which derives ground speed and drift angle information are contained in a standard ½-ATR package. Weight of the entire system is approximately 60 lbs.

Circle No. 165 on Reader Service Card.



Lock Pliers

Handicraft Tools, Inc., Division of X-acto, Inc., Long Island, N.Y., has designed a new type of pliers. Called the Lock-GriPlier, it has a locking arrangement that allows its jaws to make a firm grip on small washers, brads, screws, and other hard-to-hold objects. In operations that require both hands free, such as soldering, the pliers can serve as a vise. Control is provided by a trigger and locking key which can be worked with one hand. The Lock-GriPlier is priced at \$4.50.

Circle No. 166 on Reader Service Card.

Gear Valve

Hydra Power Corp., New Rochelle, N.Y. is selling a six-way, four-position solenoid valve, HP 466100, which combines the functions of two separate valves to control the landing gear and landing gear doors of a 3,000 psi, 275F aircraft

hydraulic system. The unit is unique in that it achieves additional porting and positions over common four-way valves with only two solenoid pilot valves. Combining these two valves into one eliminates two solenoids and two hydraulic line connections.

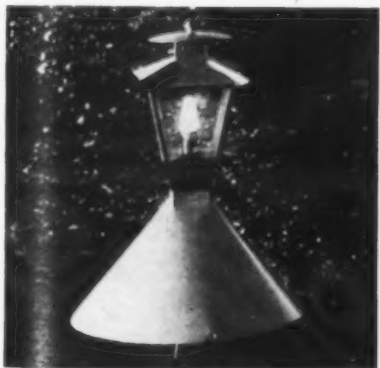
Circle No. 167 on Reader Service Card.



Fuel Nozzle

A single-point underwing nozzle, offered by Milwaukee Valve Co., subsidiary of Controls Co. of America, Milwaukee, has been approved for airline use. Designated Model P-2760, the nozzle is also adaptable for bottom-loading of gasoline transports. It features a quick removal strainer, which can be taken out without removing the nozzle. The strainer is 100 mesh, installed in the 2½ in. nozzle.

Circle No. 168 on Reader Service Card.



Runway Lights

Arkla Air Conditioning Corp., Evansville, Ind., subsidiary of Arkansas-Louisiana Gas Co. is making gas lights for airport use. Called the "Gaslite," these units have been installed at the Saline County Airport at Benton, Ark.

An installation of Gaslites consists of a string along either side of the runway, at 150-ft. intervals. Six other lights at the threshold are arranged in a "T," and have blue-green lenses. The units are mounted on 11-in. cones, painted international yellow, inside of which is a 3-ft. gas coil of ¼ in. copper tubing.

A photo-electric cell controls the intensity of the light. As darkness increases,

the cell increases gas pressure to the lights, in turn raising the flame.

Total cost of the Saline County installation was \$1,000 for the 3,100-ft. strip.

Circle No. 169 on Reader Service Card.

TECHNICAL LITERATURE

Data Display—Waldorf Electronics has published a booklet about a group of Waldorf data displays including: servo repeater indicators, drift angle and ground speed indicator, flap and trim position indicator, and a directional horizon.

Circle No. 170 on Reader Service Card.

Hangar Heat—20-page brochure presents complete line of hangar heating installations utilizing overhead revolving discharge heaters. Bulletin discusses problems and solutions in hangar heating, shows typical installations. L. J. Wing Mfg. Co., Linden, N.J.

Circle No. 171 on Reader Service Card.

Day-Glo—4-page bulletin from Switzer Bros., Inc., Cleveland, describes Day-Glo aircraft markings to reduce collision hazards and dress up your airplane. Also shows design schemes for the JetStar.

Circle No. 172 on Reader Service Card.



FLIGHTEX FABRIC

WORLD'S PREMIER AIRPLANE FABRIC

THE DEPENDABLE SOURCE OF SUPPLY

FOR: AIRCRAFT FABRICS • TAPES • ACOUSTICAL INSULATION

FLIGHTEX FABRICS, INC.

93 Worth Street • New York 13, N. Y.

Leading Manufacturers of Fabrics and Tapes for the Aircraft Industry

Circle No. 31 on Reader Service Card.



Eliminates antenna shading

Autonetics' new *Automatic Antenna Selector* insures uninterrupted radio reception in military and commercial aircraft. Used with dual-antenna systems, it assures a strong, continuous signal. Does away with manual switching and losses due to coaxial tees in the antenna feedlines. Simple to install... has a 10,000-hour operating life with minimum maintenance ...completely reliable during high-speed maneuvers and in environmental extremes. Meets stringent military requirements.

Autonetics 

A Division of North American Aviation, Inc., Downey, California



JET AGE EXPERIENCE



To serve you now and in the future

Jetliners on order will make real demands on petroleum suppliers. With fuel requirements increased four-fold by the huge commercial jets, will your supplier be able to provide proper service in the difficult years ahead?

Twelve years ago, Esso pioneered and developed high-speed hydrant refueling. This speedier and safer method is now available at many major international airports—a practical and efficient solution for the increased fuel capacities of today's large piston-engined airliners and

tomorrow's giant jetliners. Esso Aviation Turbo Oils 15 and 35, developed more than a decade ago, were the first synthetic lubricants approved for the engines of the world's most advanced turbine airliners.

Your experienced Esso airline representative and technical service man will be glad to show you how Esso has prepared to meet your aircraft's unique fuel and lubrication requirements. No matter how complex your problem, Esso can serve you better.

A good sign to fly with...



AVIATION PRODUCTS



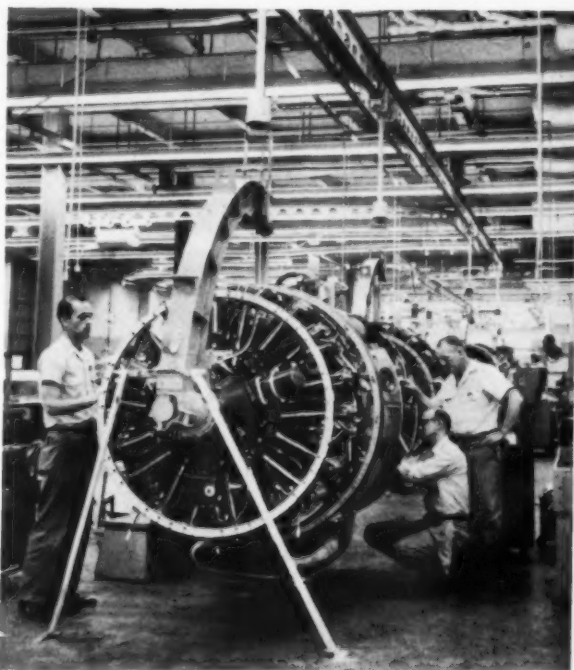
Braniff's \$6.5 Million Maintenance Base

Newest among airline integrated maintenance and operations bases is Braniff's \$6.5 million facility at Love Field, Dallas. Covering some 425,000 sq. ft., it replaces four Lockheed war-surplus hangars used by Braniff since 1946 and hikes airline's monthly rental bill from \$2,000 to \$30,000.

New base will handle 707 and Electra overhaul, but P&W J75 engines will be overhauled by Southwest Air-motive across the field and D501 turboprops by Allison. Carrier has set aside some \$850,000 to equip the new shop, expects to save more than \$3 million by delaying the start of turbine engine overhaul in its own shops.



Overall View of Braniff's new \$6.5 million maintenance operations base.



Powerplant Installation occupies 4,800 sq. ft., all air conditioned. Hook suspended from overhead monorail is a Braniff in-house development to increase workroom yet save floor space. At right, Foreman Sam Holt checks Wright EAL Turbo Compound with mechanic Dick Price.



Spacious Sheet Metal Shop employs 28 technicians, handles such items as cowlings, control surfaces etc. At left, J. R. Horton, director of maintenance and engineering, inspects shop with superintendent Buford Minter (second from left).



Inside New Hangar Douglas and Lockheed transports undergo base maintenance. This area will accommodate two Boeing 707s, has a special 10-ft. tail gate opening in big Byrne hangar doors to clear 707 tail.



For replacement parts, there is no source like the original manufacturer!

The problem of bogus* parts in the aircraft engine parts market is becoming serious. More and more counterfeit parts are filtering in. They are difficult to detect. While they may look genuine they can cause trouble.

In aviation there is no substitute for quality. Play it safe. Make certain the replacement parts you use are genuine.

When a Pratt & Whitney Aircraft engine leaves our plant it's as good as we can make it. It's built to stay that way if properly serviced, using replacement parts that are exactly the same as original parts.

As the Flight Safety Foundation, Inc., points out in *The Problem of Bogus Parts*,* "Another reason for serious concern is that the airworthiness certificate of your aircraft may be suspended or revoked if bogus parts are used in its repair, overhaul or maintenance."

Protect yourself against trouble with bogus parts by dealing with the original manufacturer, his authorized distributors or dealers, or recognized, reputable overhaul or maintenance agencies.

*"The Problem of Bogus Parts," published by Flight Safety Foundation, Inc. A free copy of this informative booklet may be obtained by writing to Pratt & Whitney Aircraft, East Hartford 8, Connecticut, attention: Service Manager.



PRATT & WHITNEY AIRCRAFT
East Hartford, Connecticut

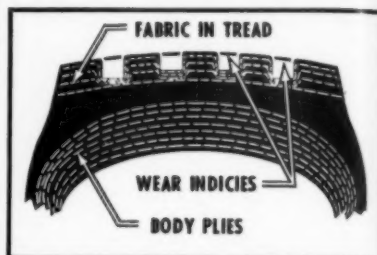


CANADIAN PRATT & WHITNEY AIRCRAFT CO., LTD.
Longueuil, P.Q., Canada

Circle No. 32 on Reader Service Card.

MAINTENANCE

AA Tests Special Tires



Schematic of AA test tire

American Airlines is service testing 30 tubeless tires having fabric in the tread instead of 100% rubber. Purpose is to determine wear characteristics. American is authorizing five retreads on the tires. Made by B. F. Goodrich, U.S. Rubber, and Goodyear, the tires are said to run 1/3 cooler than conventional models.

BNF Reworks Turbo Compounds



Braniff cockpit selector and indicator

Positive results from a service test of new instrumentation on a Wright Turbo Compound engine has touched off a major modification program at Braniff Airways.

Despite this relatively late date in operation of Turbo Compounds at Braniff (it gets its Electras in July and 707s in January), the carrier is launching a \$14,919 project to combat cylinder combustion chamber problems.

It expects to modify its entire fleet by September and is willing to undertake the \$2,300 per airplane rework at a weight penalty of 60 lbs.

The rework involves installing 16 additional temperature resistance bulbs on each engine to provide a cylinder head temperature reading for every cylinder instead of the usual two. A small panel with a dual head temperature indicator and selector switch will be added in the cockpit.

Leading up to the rework, Braniff tested two engines with this hook-up, put engineering representatives aboard schedule flights, and gleaned some new basic information on how the Turbo Compound performs in flight.

For example, with 25°-35° fuel pump timing, the hottest cylinders with either compensated or uncompensated fuel lines were the #1 and #11 in cruise #2 and #17 in climb and #6 and #17 at METO

THE BULLETIN BOARD

(max except takeoff) power. Only one of these cylinders is instrumented in the standard Turbocompound.

Braniff found fuel injection nozzles are very critical. In several cases wherein a particular head temperature rose out of proportion to others, a nozzle change brought it back into line.

In two instances when head temperatures led to prop featherings, a check showed the valve adjustment screws had backed out. Braniff feels the cost of the entire test program was more than repaid by avoiding failures on these two engines alone.

As a result of the test, here's what Braniff is doing to reduce Turbo Compound failures:

- High blower cruise is operated at 15% BMEP drop.
- Controls are being tightened in the overhaul of injection nozzles.
- Engineering is reviewing daily all flight engineer logs and pilot reports to detect first signs of engine "sickness."
- Non-swelling Teflon or steel fuel lines will be introduced.
- Additional testing of 100° overlap engine cams is underway.

The program at Braniff is being monitored by asst. chief engineer, F. L. Achilles, Jr.

Dynamometer Pays Off

Use of Clayton Dynamometers for testing overhauled engines is permitting Trans World Airlines to handle 15% more engines with 25% less manpower, Ray M. Dunn, TWA v.p. maintenance and stores reports.

Some statistics: Early detection of low torque cell readings saves \$700 a month; more accurate fuel flows save \$250,000 annually.

Undisplayed Advertising: \$2.00 per line, minimum charge \$6.00. Cash with order. Estimate 30 capital letters and spaces per line; 40 small lower-case letters and spaces per line. Add two lines if Box Number is included in lieu of advertiser's name and address.

Displayed Advertising: \$20.00 per column inch. Space units up to full pages accepted in this section for classified-type advertising.

Forms close three weeks preceding date of issue. Address all correspondence to Classified Advertising Department, Airlift Magazine, 1001 Vermont Ave., N.W., Washington 5, D.C.

FOR SALE
C-46F AIRCRAFT
Passenger and Cargo
With or Without
T-Category Kit Installed
Immediate Delivery
The Flying Tiger Line Inc.
Burbank, Calif.
Call or Cable
Fred Benninger
Executive Vice President
Tel: Stanley 7-3411 Cable: Flytiger

Help Wanted

Schedule Man

Trunkline needs young relatively experienced person for schedule planning and analysis. Furnish resume and salary. Box 179, Airlift Magazine, 1001 Vermont Ave., N.W., Washington 5, D.C.

AN FITTINGS & HARDWARE

Stainless, Aluminum, Brass, Steel All sizes—immediate delivery from world's largest shelf stock. Buy direct from manufacturer. Lower prices—quicker service. Send for free wall charts showing complete line of AN & MS fittings and hardware. We machine parts to your own print; also, we sell AN & MS Forgings.
COLLINS ENGINEERING CORPORATION
9000 Washington Blvd., Culver City, California

DC3-C47 AIRCRAFT FOR SALE

We offer, buyer's selection 1 to 5 units of our DC3-C47 fleet of 15 aircraft, excellent condition. Potential buyers please write or cable for detailed specifications.

AEROVIAS VENEZOLANAS, S.A.
Apartado 943, Caracas, Venezuela. Cable address: Avensa, Caracas

Situation Wanted

'B.S. Aeronautical Admin.; M.S. Business Admin. Married, 30. Strong, diversified Business—Aviation training and experience. Seeking growth opportunity in General Aviation. Reply Box 178, Airlift Magazine, 1001 Vermont Ave., N.W., Washington 5, D.C.

AD INDEX

Acme Industrial Co.	50	Lear, Inc.	8, 9
Agency—Rickeltes & Co.		Agency—General Adv. Agency	
Air Cruisers Co., Div., The Garrett Corp.	71	George L. Nankervis Co.	12
Agency—J. Walter Thompson Co.		Agency—Brewer Assoc.	
AirResearch Aviation Service Co., Div., The Garrett Corp.	22	North American Aviation, Inc.	73
Agency—J. Walter Thompson Co.		Agency—Batten, Barton, Durstine & Osborn, Inc.	
B & H Instrument Co., Inc.	80	Ontario International Airport	58
Agency—The Kotula Co.		Agency—The Essig Co. Adv.	
Boeing Airplane Co.	10	Phillips Petroleum Co.	36
Agency—Calkins & Holden, Inc.		Agency—Lambert & Feasley, Inc.	
Braniff International Airways, Inc.	35	Pratt & Whitney Aircraft Div., United Aircraft Corp.	76
Agency—Potts Woodbury, Inc.		Agency—Lennen & Newell, Inc.	
Bulletin Board (Classified)	77	Puritan Compressed Gas Corp.	50
Canadair Ltd. (Sub. of General Dynamics Corp.)	38, 39	Agency—Rogers & Smith Adv. Agents	
Agency—Walsh Adv. Co., Ltd.		Resistoflex Corp.	68
Chicago Helicopter Airways, Inc.	72	Agency—Marsteller, Rickard, Gebhardt & Reed, Inc.	
Collins Radio Co.	20, 21	Rolls-Royce, Ltd.	48
Agency—W. D. Lyon Co.		Agency—The Wesley Assoc., Inc.	
Delta Air Lines	18	Rotol Ltd.	19
Agency—Burke, Dowling Adams, Inc.		Agency—Gaynor & Ducas, Inc.	
Esso Export Corp.	74	Sierra Engineering Co.	69
Agency—McCann-Erickson, Inc.		Agency—Guerrin, Johnstone, Jeffries, Inc.	
Flightex Fabrics, Inc.	73	Straham Valves, Inc.	58
Agency—The Powerad Co.		Agency—Picard Adv., Inc.	
General Electric Co., Lamp Div.	4	Texas Co., The	79
Agency—Batten, Barton, Durstine & Osborn, Inc.		Agency—G. M. Basford Co.	
Goodyear Tire & Rubber Co., Inc.	3	Trans World Airlines, Inc.	6
Agency—Kudner Agency, Inc.		Agency—Foote, Cone & Belding	
Hardman Tool & Engineering Co.	59, 60, 61, 62	Westinghouse Electric Corp.	46, 47
Agency—The Essig Co.		Agency—Ketchum, MacLeod & Grove, Inc.	
Holley Carburetor Co.	14, 15	Wilcox Electric Co.	2
Agency—Clark & Roberts, Inc.		Agency—Valentine-Radford Adv.	



Photos by Wayne W. Parrish

RUSSIAN YOUNGSTERS outside a typical wooden house in a fishing village on Lake Baikal in Siberia.

Out in the central part of Siberia there is a city with one of those magic faraway travelogue names which one sees on every world map.

This one is called Irkutsk and it's just 65 miles away from Lake Baikal, a 400-mile-long lake which also shows up on every map. And it's just 75 miles north of Outer Mongolia, one of the countries to which Americans aren't permitted to travel.

Last year the Soviet government opened Irkutsk to foreign tourists, so I had it as a prime target on my trip last fall. I decided to fly by Tu-104A jet 3,000 miles east of Moscow to reach this farthest away city which foreigners could visit without getting extraordinary Soviet permission. Flying by jet to Siberia—now there's an objective worth having.

Accompanied by our personable and well-educated Intourist interpreter, Raya Smirnova, my wife and I took very little baggage as we were returning to Moscow before proceeding to Central Asia. Departure was on the daily 5 p.m. Aeroflot flight (No. 013) to Peking, capital of Red China. When we got to the airport we had to wait for an hour and a half. Bad weather was reported at Omsk, our refueling point half-way to Irkutsk.

When the flight was finally called it was almost dark and Raya had gotten the dope that we were going to stop at Sverdlovsk for refueling instead of Omsk. Believe it or not, but the Peking flight is announced over the terminal loudspeakers in Russian and English, but not Chinese.

On board was a strange assortment of passengers—Russians, Mongols and Chinese. Some were getting off at Irkutsk, obviously, but others were going through

EN ROUTE

Wayne W. Parrish



Two Haircuts in Russia

Off to see Irkutsk . . . Bad weather, bad chickens

to Ulan Bator, capital of Outer Mongolia and Peking, end of the jet route. The clothing was quite varied and winter weight.

I must say that getting on the Peking flight had all the earmarks and atmosphere of an adventure. Irkutsk is a long way off from anywhere and I wondered what would happen if we couldn't land and had to overfly to Ulan Bator.

About a third of the passengers had net sacks of apples which they placed in the hatracks or elsewhere, and here was one evidence of the retarded state of Soviet agriculture. These apples were typical of those sold on the streets and in the stores in Moscow; they were small, often gnarled, wormy, and green. There isn't a store in America that could even give them away. Yet these very poor quality apples were being carried thousands of miles by jet to areas where obviously they had no apples at all.

This was my first flight on a Russian jet and the three of us had the best seats at the front of the main cabin where we had a table and a good reading lamp. There were three stewardesses on board, but not in snappy uniforms. The weather was a little chilly in Moscow (October) and we expected colder weather in Siberia. Every one of the 70 seats was occupied. The cabin interior of the Tu-104A was dim, due to the poor lighting system.

I had a seat belt but in name only. The tip of one strap had been broken off and glued back on. Under no circumstances could it be forced through the metal clasp. (On the return flight I had only one strap so I have the distinction of having flown 6,000 miles to Siberia and back by jet

without a workable seat belt.)

The Tu-104A has cabin signs in Russian for fastening seat belts and for no smoking on landing and takeoffs. Most of the seat belts were in working condition.

Our jet was towed by truck for about a thousand feet, then the two engines were started. We taxied for takeoff to the west. The Tu-104A takes most of any runway and the climb was smooth but very gradual. We flew for quite a while before turning east for the hour and a half hop to Sverdlovsk. Even with our gradual climb, however, I noticed the altitude in my ears; the Tu-104A pressurizing system is quite poor. There was virtually no vibration and the cabin noise level was good—lower than that of the more powerful Boeing 707.

In each seat pocket was an oxygen mask. While our plane was being towed from the apron, one of the stewardesses announced in Russian that the masks were for emergency purposes only and that so far they had never been required. Raya translated the announcements for us in English.

The three stewardesses lost no time in serving dinner on metal trays. There was hot consommé and some cold chicken, the toughest and most miserable chicken I've ever encountered. Never have I had to use such force of my teeth to pull off a little meat. But the bread was good and there was a small salad. (After returning to Moscow I told an Aeroflot official about the tough chicken. I said I was sure it had walked all the way to Moscow from Murmansk on the Arctic Ocean. He roared with laughter; even Russian airline men have a good sense of humor.)



MRS. WWP WATCHES fishermen just in with a catch on Lake Baikal. Although it was before mid-October, it was snowing in the mountains on the east side of the lake. It never warms up enough for swimming in this big Siberian lake.



THE OLDER PARTS of Irkutsk, a major city of 320,000 in Siberia, look like this. Fancy woodwork is a feature. The street is paved with big stones. Newer parts of the city, however, have apartment houses and some three-to-five story buildings.

FIRST CLASS
Permit No. 2455-R
(Sec. 510 P. L. & R.)
Washington, D.C.

BUSINESS REPLY MAIL

No postage stamp necessary if mailed in the United States

POSTAGE WILL BE PAID BY

airlift

17 East 48th Street
New York 17, New York

FIRST CLASS
Permit No. 2455-R
(Sec. 510 P. L. & R.)
Washington, D.C.

BUSINESS REPLY MAIL

No postage stamp necessary if mailed in the United States

POSTAGE WILL BE PAID BY

airlift

17 East 48th Street
New York 17, New York

Aircraft Data Cards

With this, the first issue of AIRLIFT, the aircraft data card series launched by American Aviation will be continued. But hereafter, only transport aircraft will be represented.

Models selected for this issue are the Armstrong Whitworth 750 Argosy, the Beechcraft Model 95 Travel Air and the Hiller 12E.

The 650 Argosy has been purchased as a troop/cargo carrier by the RAF, and is scheduled to under-

go test trials later this year with Riddle Airlines.

Model 95 is the latest Beech airplane to carry the Travel Air name. It first flew in 1956, and received its Type Certificate in June 1957.

Hiller 12E will carry 65% more payload 50 miles further than its predecessor, the 12C. Basically an H-23D with a Lycoming VQ540 engine, the 12E has interchangeable all-metal rotor blades.

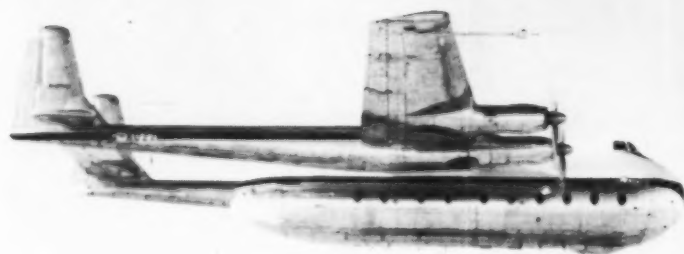
BEECHCRAFT MODEL 95 TRAVEL AIR



Aircraft Data Card
April, 1959

Copyright 1959
American Aviation Publications, Inc.

ARMSTRONG WHITWORTH 650 ARGOSY



Aircraft Data Card
April, 1959

Copyright 1959
American Aviation Publications, Inc.

HILLER 12E



Aircraft Data Card
April, 1959

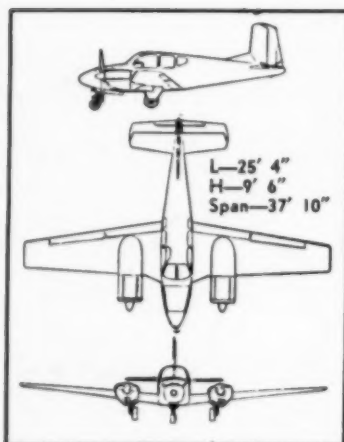
Copyright 1959
American Aviation Publications, Inc.

**ARMY: H-23D RAVEN
U.S. NAVY: HTE**

—FOR MORE INFORMATION—

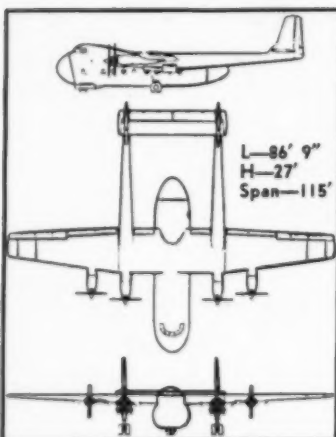
USE THE ATTACHED REPLY CARDS for additional information about any product or service advertised or reported in this issue of AIRLIFT. Circle the numbers on the card that correspond

with numbers appearing beneath items described. Requests will be forwarded to the companies concerned. No additional postage required.



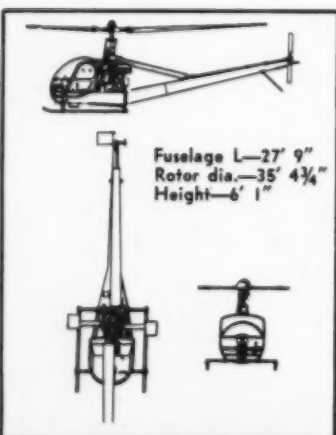
BEECHCRAFT MODEL 95 TRAVEL AIR

TYPE: Twin-engine, 4-place executive transport. WEIGHTS: empty—2,580 lbs.; gross—4,000 lbs. POWERPLANTS: (2) Lycoming O-360-A1A; rating—180 hp. PERFORMANCE: max. cruise speed—200 mph; max. speed—209 mph; initial rate of climb—1,360 fpm; max. range with 112 gal. fuel cap.—1,410 mi. MFR.: Beech Aircraft Corp., Wichita, Kan. NOTES (for your personal use):



ARMSTRONG WHITWORTH 650 ARGOSY

TYPE: 80-passenger twin-turboprop. transport. WEIGHTS: empty—45,350 lbs.; gross—82,000 lbs. POWERPLANTS: (2) Rolls-Royce R. D.a 7/2; rating—2,100 eshp. PERFORMANCE: cruise speed—296 mph; initial rate of climb—1,200 fpm; range with 3,300 gal. fuel capacity—2,600 mi. MFR.: Armstrong Whitworth Aircraft Ltd., Baginton, Nr. Coventry, Eng. NOTES (for your personal use):



HILLER 12E

TYPE: 3-place, single-engine utility helicopter. WEIGHTS: empty—1,700 lbs.; gross—2,700 lbs. POWERPLANT: Lycoming VO-540; max. rating—305 hp derated to 280 hp. PERFORMANCE: max. speed—98 mph; cruise speed—82 mph; initial rate of climb—1,300 fpm; range with 46 gal. fuel capacity—185 mi. MFR.: Hiller Aircraft Corp., Palo Alto, Calif. NOTES (for your personal use):

airlift

April 1959

Expires June 15, 1959

NAME

TITLE/POSITION

COMPANY

Product Mfg./Service Offered

ADDRESS

CITY

ZONE

STATE

Card cannot be processed unless all information is given. Please limit requests to ten items.

CIRCLE NUMBERS BELOW FOR INFORMATION ON PRODUCTS, LITERATURE OR ADVERTISEMENTS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125
126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200

airlift

April 1959

Expires June 15, 1959

NAME

TITLE/POSITION

COMPANY

Product Mfg./Service Offered

ADDRESS

CITY

ZONE

STATE

Card cannot be processed unless all information is given. Please limit requests to ten items.

CIRCLE NUMBERS BELOW FOR INFORMATION ON PRODUCTS, LITERATURE OR ADVERTISEMENTS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125
126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200



LOOK UP!
THERE GOES...

TEXACO SYNTHETIC AIRCRAFT TURBINE OIL

As the commercial jets streak their vapor trails more and more frequently across the sky, you'll find Texaco up there flying with them.

Leading U. S. jet turbine manufacturers* have approved Texaco Synthetic Aircraft Turbine Oil 15 or EMS—and the airlines know and rely on the famous Texaco quality and aviation engineering service that have kept Texaco predominantly the leader in aircraft lubrication for the past quarter century.

Every lubricant characteristic essential to jet service is amply found in Texaco Synthetic Aircraft Turbine Oil—low viscosity at low temperatures, low volatility, good oxidation and thermal stability at high temperatures, non-corrosiveness to engine metals and excellent gear load-carrying ability. Its performance in high speed high temperature bearings under severe operating conditions has been proved outstanding.

Call the nearest of the more than 2,000 Texaco Distributing Plants in all States, or write:

The Texas Company, *Aviation Sales Department*, 135 East 42nd Street, New York 17, N. Y.

*PRATT & WHITNEY AIRCRAFT JT-3 and JT-4 engines used in Boeing 707s, 720s and Douglas DC-8s. GENERAL ELECTRIC CJ-805 engine used in Convair 880s. ALLISON 501-D-13 engines used in Lockheed Electras.



TEXACO
LUBRICANTS
AND FUELS

for Jet, Prop-Jet and Piston-Engine Aircraft



The
B&H

JETCAL

ANALYZER NOW SAFEGUARDS PASSENGER JETS

Assures...

Maximum Range

Lower Operating Costs

Increased Safety

Peace of Mind

...for crew

and passengers!

1) Tests EGT System Accuracy to $\pm 4^{\circ}\text{C}$ (functionally, without running the engines).

2) Runs Temperature Spread Check on Two Engines at Same Time. Cuts Test Time 50%

3) Tests RPM Accuracy to 10 RPM in 10,000 RPM ($\pm 0.1\%$).

4) Checks Heat, Anti-Ice and Fire Detection Systems.

The JETCAL® is in worldwide use ...by the U.S. Navy and Air Force as well as by major aircraft and engine manufacturers...and air lines. Write, wire or phone (EDison 6-7243) for complete information.



B & H INSTRUMENT CO., INC.

3479 West Vickery Blvd. • Fort Worth 7, Texas

Sales Engineering Offices:

COMPTON, CALIF.: 105 North Bradfield Ave., NE 6-8970 • **VALLEY STREAM, L. I., N. Y.:** 108 South Franklin Ave., LO 1-9220 • **DAYTON, OHIO:** 5606 Rice Pl., BE 3-4411
ENGLAND: Bryans Aeroequipment Limited, 15, Willow Lane, Mitcham, Surrey—Exclusive Licensee and Manufacturer for Great Britain, British Commonwealth and Europe.

Circle No. 17 on Reader Service Card.